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Final Response to BDAT Related Comments Document D002
Volume 1-C

(U.S.) Environmental Protection Agency, Washington, DC

May 90



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**FINAL
RESPONSE TO BDAT RELATED COMMENTS DOCUMENT**

D002: Characteristic Corrosive Wastes

VOLUME I-C

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INTRODUCTION

This response to comments document only addresses those comments which were submitted on the proposed land disposal restrictions for those waste codes and general BDAT technologies and issues which relate to Third Third Wastes Treatment Standards.

The commenters presented in this document are grouped according to major concerns of the commenters. This document is comprised of the following sections:

ISSUE CODE 1: General BDAT Aspects

ISSUE CODE 2: D001 - Characteristic Ignitable Wastes

ISSUE CODE 3: D002 - Characteristic Corrosive Wastes

ISSUE CODE 4: D003 - Characteristic Reactive Wastes and P and U Wastes Containing Reactive Listing Constituents

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ISSUE CODE 6: D005 - Characteristic Wastes for Barium and P013

ISSUE CODE 7: D006 - Characteristic Wastes for Cadmium

ISSUE CODE 8: D007 - Characteristic Wastes for Chromium

ISSUE CODE 9: D008 - Characteristic Wastes for Lead P and U Wastes Containing Lead

ISSUE CODE 10: D009 - Characteristic Wastes for Mercury P and U Wastes Containing Mercury

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ISSUE CODE 25: K015 - Still Bottoms from Benzal Chloride

ISSUE CODE 26: K021 - Spent Antimony Catalyst.

(No Comments Were Received for this Waste Code)

ISSUE CODE 27: K046 - WW Treatment Sludges from Manufacturing,
Formulating, and Loading of Lead-Based Initiating Compounds

ISSUE CODE 28: K060 - Ammonia Still Lime Sludge.

(No Comments Were Received for this Waste Code)

ISSUE CODE 29: K061 - Electric Arc Furnace Dust

ISSUE CODE 30: K069 - Emission Control Dust/Sludge from Secondary
Lead Smelting

ISSUE CODE 31: K071, K106 - Mercury Cell Process Wastes

ISSUE CODE 32: K073 - Chlorinated Hydrocarbon Wastes.

(No Comments Were Received for this Waste Code)

ISSUE CODE 33: K086 - Residues from Ink Formulation

ISSUE CODE 34: K100 - Waste Leaching Solution from Acid Leaching of
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(No Comments Were Received for this Waste Code)

ISSUE CODE 35: Wastes Containing Cyanide

ISSUE CODE 36: K017 - Wastes from the production of Epichlorohydrin

(No Comments Were Received for this Waste Code)

ISSUE CODE 37: K028, K029, K095, K096 - Production of 1,1,1-
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(No Comments Were Received for this Waste Code)

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(No Comments Were Received for this Waste Code)

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(No Comments Were Received for this Waste Code)

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Commenters are identified by both commenter number and commenter name. Comments within each section of this document have been assigned a sequential comment number.

Issues were obtained from the original comment submittal and were categorized based on the grouping specified above. The Agency's response to each comment follows immediately after the text of the document. For responses related to capacity issues, the reader should review the "Response to Comments Background Document for the Third Third Land Disposal Restrictions Proposed Rule, November 22, 1989. Volume II Capacity Related Comments." For information regarding broad policy questions, the reader is directed to the "Response to Comments Background Document for the Third Third Land Disposal Restrictions Proposed Rule, November 22, 1989. Volume III Policy Related Comments."

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No Comments Were Received for this Waste Code

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COMMENT NUMBER:

3-A-1

DOCKET NUMBER:

LD12-00081

COMMENTS:

EnviroSafe Management Services Inc

ISSUE:

D002 - Characteristic Corrosive Wastes

SUBISSUE:

Proposed pH requirement

COMMENT:

Under corrosive characteristic waste, EPA is looking at neutralization, pH 6 through 9. Again there is a question of whether or not stabilization of a corrosive characteristic waste is a viable treatment option. In stabilizing an acid waste, the material will be raised through the pH 6 to 9 range during stabilization. However, the pozzolonic or cement based stabilization used on an alkaline waste would appear that it must be lowered first to a pH of 6 to 9 only to be raised above 9 by the stabilization activities.

COMMENT NUMBER: 3-A-1
DOCKET NUMBER: LD12-00081
COMMENTER: Envirosafe Management Services Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for D002 wastes. Because of the diversity of treatment technologies applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. The Agency considers stabilization to be a viable treatment option for D002 acid and alkaline wastes containing metals and high suspended solid contents as long as the stabilization process is adequate to remove the characteristic of corrosivity. A list of applicable technologies that, when used alone or in combination are capable of achieving this standard, is enclosed in 40 CFR 268 Appendix VI. Also see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A-2
DOCKET NUMBER: LD12-00089
COMMENTER: MILL SERVICE INC
ISSUE: D002- Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

Corrosive Characteristic Wastes

EPA is proposing a treatment standard of "Base Neutralization to pH 6-9 and Insoluble Salts" for D002 Acidic wastes and "Acid Neutralization to pH 6-9 and Insoluble Salts" for D002 Alkaline wastes. The pH range was selected based on the impact of lower pH solutions on clay liners, the relative mobility of hazardous constituents in lower pH solutions and a simulation of the buffering of natural aquatic systems. While we agree that these reasons may justify the lower pH limit proposed, other factors should be considered in establishing the upper pH limit. Foremost is the fact that many D002 Acidic wastes contain relatively high concentrations of dissolved metallics, some of which may be hazardous, such as cadmium and lead, and some of which may be non-hazardous, such as nickel and zinc. Neutralization to pH 6-9 may not remove these constituents as effectively as neutralization to a higher pH would, resulting in a treated waste with a higher toxicity and a higher concentration of mobile constituents.

Further, as EPA has indicated in later sections of the proposed rule, typical practice at facilities that co-dispose all "metal" wastes is to add excess lime to the waste to prevent migration of metals. In fact, the surface impoundment utilized for disposal at our active disposal facility receives only "metal" wastes and the permit issued for the unit requires the neutralization of all wastes to pH 9-12.4 prior to disposal in the unit for the purpose of migration of the metals. It is likely that other companies have similar restrictions in their operating permits.

We believe that these factors should be considered in establishing the treatment standard for D002 wastes and propose that the upper pH limitation be established as "less than pH 12.5".

COMMENT NUMBER: 3-A-2
DOCKET NUMBER: LD12-00089
COMMENTS: Mill Service Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by the commenter. Waste characterization data show that many D002 wastes also contain metal constituents. Treatment at a pH of about 10 is optimum for removal of many metals and subsequent stabilization to prevent migration. By proposing a 6-9 pH requirement, the Agency did not intend to interfere with pH requirements for other necessary components of treatment trains. Based on information received from commenters, the Agency has decided not to promulgate the 6-9 pH requirement. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for D002 wastes. The Agency has established this standard to allow the regulated community the flexibility to use the best technology for each specific D002 wastestream. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3-A-3
Docket Number LD12-00110
Commenter ThermalKEM/CyanoKEM
Issue D002 - Characteristic Corrosive Wastes
Subissue Proposed pH requirement
Comment

1. D002 Wastes

EPA inappropriately proposed the treatment standard for pH for D002 waste streams at pH values between 6.0 and 9.0. Although it is true that these wastes are corrosive material and can be neutralized to reduce corrosivity by addition of acid or base to obtain a final pH of 6.0 to 9.0, some parameters of concern may not be effectively treated within this pH range.

In many cases, corrosive liquids are contaminated with heavy metals and/or anions (like cyanide) which require removal or destruction before the wastewaters can be discharged to POTW's or other outfalls. The non-wastewater residues from treatment of these waste streams will reflect the pH characteristics of the treatment conditions used to precipitate and remove or destroy these contaminating species.

In many cases, pH values as high as 10 to 11.5 units have to be maintained during treatment to effectively reduce such contaminating parameters as complexed copper, nickel, zinc and other heavy metals as well as phosphates and certain other anions. Metal solubility issues with pH and metals such as nickel, chromium and lead have minimal solubilities at pH values above 9.0 (see Development document for effluent limitations for electroplating point source category, EPA Effluent Guideline Divisions, August, 1973).

Limiting the non-wastewater residue from these treatment processes would severely limit the effectiveness of the removal of these contaminating parameters. Therefore, we recommend setting pH standards for D002 corrosive waste streams at 6.0 to 11.5 units in order to allow proper treatment and removal of contaminating toxic parameters.

EPA's proposed treatment standard of $6 < \text{pH} < 9$ will preclude the optimum treatment of metal-bearing corrosive wastes because the treatment standard's upper limit does not permit optimum stabilization of such wastes. In providing the greatest environmental and human health benefit for metal-bearing corrosive wastes, the waste treater must accomplish three objectives: 1) increase the pH of the waste stream, 2) precipitate the stream's solubilized metals, and 3)

Comment Number:

3-A-3 continued

Docket Number:

LD12-00110

Commenter:

ThermalKEM/CyanoKEM

Issue:

Subissue:

D002-Characteristic Corrosive Wastes

Comment:

Proposed pH Requirement

stabilize the resulting solids to prevent re-dissolution or leaching of metals in the future. Therefore, the solids resulting from the treatment of corrosive liquids (particularly, metal-bearing acids) must sometimes be stabilized at a pH approaching 12.5 to truly minimize the potential of metals leaching and migration.

We believe that EPA has already recognized and endorsed the need to stabilize metal-bearing wastes in a final matrix which has a pH well above the proposed limit of pH 9. Most notably in its promulgation of the treatment standard for F006 non-wastewaters (and a variety of other metal-bearing listed wastes), the Agency established part of the treatment standard on stabilization with cement kiln dust - a process which can yield a product with a pH above 12.5. It is crucial to realize that the neutralization of corrosive wastes results in the co-generation of both wastewater (the effluent) and non-wastewater (the precipitate); therefore, the F006 treatment standard is germane to this issue. A variety of F006 waste streams also exhibit the characteristic of corrosivity. Because F006 streams are listed, in part, on the basis of their metals content, and given that metals must typically be stabilized in processing conditions well above pH 9.0, the Agency's proposed standard directly conflicts both with previously promulgated standards and with the objective of reducing the mobility of toxic constituents, particularly for acid and alkaline metal-bearing corrosive wastes.

Higher pH limits are also supported by the Agency's report to Congress dated February 7, 1986, wherein EPA summarizes the effects of the domestic sewage exclusion. [The Study was statutorily mandated per HSWA section 3018(b).] As an outcome of both the Study and a subsequent ANPR published at 51 FR 30166, EPA concluded two points: 1) virtually all pH related incidents at POTW's involved acidic wastes and 2) the Agency has no evidence to conclude that high pH wastes are a problem for most POTW collection systems. Clearly, higher pH limits should be allowed for the acid and alkaline wastes for subcategory 261.22(a)(1).

Comment Number: 3-A-3 Continued
Docket Number: LD12-00110
Commenter: ThermalKEM/Cyano KEM
Issue:
Subissue: D002-Characteristic Corrosive Wastes
Comment: Proposed pH Requirement

We agree that this is a crucial consideration, and we re-emphasize that metals solubilization is largely a factor of acidic pH. Also, it is important to note that metals solubilization is also a function of alkaline pH to the extent that metals tend to leach and re-solubilize at pH's in the weak to moderate alkaline range. It is typically in the range of 10-11.5 that metals stabilization is optimized. At such a pH level, the process residual retains sufficient alkalinity to prevent metals leaching. Again, we emphasize that,

while the proposed standard is aimed at "aqueous" corrosive wastes, solids result from the neutralization process; the standard must necessarily consider the pH issue with respect to the waste in its treated form and resultant precipitate.

The 11.5 upper alkaline pH limit must not be applied to the non-wastewater stabilized residual, and should only be applicable to the wastewater consistent with the corrosive waste definition limited to aqueous or liquid waste under 261.22(a)(1) and (2). If the Agency's intention is to set a non-wastewater standard, this should be set at a level of 12.5, since many stabilization agents such as lime and kiln dust have pH levels in this range.

COMMENT NUMBER: 3-A-3
DOCKET NUMBER: LD12-00110
COMMENTER: ThermalKEM/CyanoKEM
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. Characterization data shows that many D002 wastes have metals and other constituents that need to be considered during treatment. For example, as noted by the commenter, a pH of about 10 is optimum for removal of many metals and subsequent stabilization. By proposing a 6-9 pH requirement, the Agency did not intend to interfere with pH requirements for other necessary components of treatment trains.

Also, the Agency believes that existing regulatory requirements such as NPDES and POTW permits, ground-water monitoring, and leachate collection are sufficient to control the factors which cause the Agency to initially propose the 6-9 pH requirement. Based on information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A-4
DOCKET NUMBER: LD12-00143
COMMENTER: General Motors Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

Corrosive Characteristic Wastes

GM disagrees with EPA's proposal to require a pH range of 6 to 9 for treatment of wastes in the D002 Acid and Alkaline subcategory (page 48422). Since hazardous waste landfills and surface impoundments are now subject to the minimum technology requirements of RCRA Section 3004(o) (liners and leachate collection), we fail to see the necessity for adopting the pH range of 6 to 9 to limit solubilization of metals and mobility of constituents (page 48423).

- We therefore recommend that the existing characteristic pH range of 2 to 12.5 be adopted as the treatment standard.

COMMENT NUMBER: 3-A-4
DOCKET NUMBER: LD12-00143
COMMENTER: General Motors Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. The Agency believes that current regulatory requirements such as NPDES and POTW permits, ground-water monitoring, and minimum technology requirements (as noted by this commenter), help to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on information received from commenters, the Agency believes that it is more appropriate to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A-5
DOCKET NUMBER: LD12-00138
COMMENTS: Occidental Chemical Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

D. The Proposed Treatment Standards for D002 Acid and Alkaline Wastes are Nonsensical, Environmentally Unacceptable, and are Technically Infeasible.

EPA has proposed treatment standards for D002 acid and alkaline wastes that consist of neutralization to within the range of pH 6 to pH 9 using agents that form insoluble salts (54 Fed. Reg. 48422). Its rationales for these proposed standards include: (1) hydronium ions may solubilize metals from clay liners; (2) hazardous constituents in ground waters may be mobilized by pH values below 6 or above 9; (3) this pH range matches the buffering capacity of natural systems; and (4) soluble salts, if improperly managed, could adversely impact fresh water systems. As will be discussed in the following comments, EPA has not conducted a thorough technical analysis of its assumptions,

and its proposed standards for D002 alkaline and acid wastes are not only technically infeasible for some wastes, but also may cause adverse environmental impacts.

With respect to acidic wastes solubilizing metals from clay liners, a 1986 study demonstrated that a clay-lined surface impoundment used to store acidic wastewaters containing high metals concentrations was highly resistant to any significant migration of metals during its eight-year operating life. Exposure to the acidic wastes did not appreciably alter the permeability and structural characteristics of the clay liner.

COMMENT NUMBER:

DOCKET NUMBER:

COMMENTER:

ISSUE:

SUBISSUE:

COMMENT:

3-A-5 continued
LD12-00138
Occidental Chemical Corporation

D002-Characteristic Corrosive Wastes

Proposed pH Requirement

This study suggests that acidic, metals-containing wastewaters and solids do not cause significant degradation of the clay structure resulting in increases in liner permeability. These results support EPA's decision to codify the statutory level of pH 2 in the California-List land disposal restrictions rule. EPA evaluated the effect of acidic wastes on landfill liners when it promulgated the California-List rules, and concluded that wastes with pH values above the characteristic level of 2 did not cause excessive increases in permeability or metals migration; there are no data or analyses provided in the current proposal that suggest that the pH range of 6-9 is required to protect the environment from metals migration.

EPA proposed pH 6-9 range for corrosive hazardous wastes also ignores the fact that naturally-occurring soils and ground waters have pH values outside this range. Based on previous EPA data, more than one-half of all groundwater will have a pH of less than 6.

With respect to the protection of aquatic ecosystems, the clean Water Act (CWA) requires that all waste discharges be permitted, and permits always include pH as a parameter, usually with limits in the range of pH 6-9. There is no regulatory need for requiring the pH 6-9 limit on wastewaters that are subject to RCRA; before they are discharged the CWA-based pH limits must be met.

COMMENT NUMBER: 3-A-5
DOCKET NUMBER: LD12-00138
COMMENTER: Occidental Chemical Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. The Agency believes that current regulatory requirements such as NPDES and POTW permits, leachate collection, and groundwater monitoring are sufficient to control many of the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on information received from commenters, the Agency believes that it is more appropriate to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A-6
DOCKET NUMBER: LD12-00111
COMMENTER: MASCO CORPORATION
ISSUE:
SUBISSUE: D002-Characteristic Corrosive Wastes
COMMENT: Proposed pH Requirement

Characteristic Wastes

The Agency is proposing treatment of characteristic wastes to well below the current level of toxic characteristics, e.g., LDR for D008 is 0.51 mg/l and the characteristic level is 5.0 mg/l.

The Company feels that treatment for LDR as applied to characteristic wastes should be limited to elimination of the characteristic that makes it hazardous. Currently, parameter standards have been established to indicate when a waste becomes hazardous. Thus, it would appear that a waste is non-hazardous if it does not exceed the established standards, e.g., D-008 for lead, E.P. at 5 mg/l. Presumably, the original establishment of these standards was based upon consideration of certain health based risks. Unless these considerations have changed, then LDR treatment standards should be only to these levels. If the health based risks are no longer adequate or flawed in some way, then the proper approach would be to revise the standards for characteristic wastes.

The Company feels this should apply across the spectrum of characteristic wastes, including the pH parameter for D002, Corrosive, and Flash Point of $\leq 140^{\circ}$ for D001, Ignitable.

COMMENT NUMBER: 3-A-6
DOCKET NUMBER: LD12-00111
COMMENTER: MASCO Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency believes that existing regulations such as NPDES and POTW permits, ground-water monitoring, and leachate collection are sufficient to control many of the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that it is more appropriate to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A-7
DOCKET NUMBER: LD12-00098
COMMENTS: B P America Inc
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

IV. The D002 Acid and Alkaline proposed treatment standard should be revised to "Treatment to Remove the Characteristic."

EPA has proposed treatment standards for D002 Acid and Alkaline Wastes that require neutralization to within pH 6 to 9 using chemicals that form insoluble salts (54 FR 48422). EPA explains that this is necessary to protect clay liners, to prevent mobilization of hazardous constituents in ground waters, to discharge waters compatible with natural systems, and to prevent discharge of soluble salts into fresh water systems. Chemical Manufacturers Association (CMA) explains in their comments that the treatment requirement is not warranted to protect the surface environment and may cause adverse environmental impacts. The treatment standard is even more inappropriate when applied to wastewater which is injected into deep subsurface formations.

B. EPA should not establish a D002 treatment standard requiring the waste to be within pH 6 - 9.

With respect to the protection of aquatic ecosystems, the Clean Water Act (CWA) requires that all waste discharges be permitted, and permits always include pH as a parameter, usually with limits in the range from 6-9. There is no regulatory need for requiring the pH 6-9 limit on wastewaters that are subject to RCRA because before they are discharged the CWA-based limits must be met.

The Agency recognizes that the pH range of 6 to 9 may not be appropriate for deep well injection into certain formations (54 FR 48423). Since deep well injection zones are not near surface aquatic ecosystems, injected fluid need not meet standards intended to protect aquatic systems.

Ironically, subsurface disposal may be environmentally preferable at lower pHs. Two studies by Louisiana State University ("Studies of the Containment of Injected Waste by Shale at the American Cyanamid Company Fortier Plant" by Aubert, W. G., et al November, 1987 and "An Experimental Evaluation of Containment Properties for Shales Associated With Deep-Well Hazardous Waste Injection Zones" by Clark, D. A., August, 1988) have investigated the interaction of acids with the underground environment. The two major findings from these studies are (1) that acids decrease the permeability of the confining shales - the containment is enhanced by acid injection, improving what is already an extremely safe containment system, and (2) acids are neutralized by the in-situ minerals present in the sands that are receiving the injected fluids. Based upon these studies it is environmentally unnecessary to require injection within a narrowly defined, near neutral range.

COMMENT NUMBER:

DOCKET NUMBER:

COMMENTS:

ISSUE:

SUBISSUE:

COMMENT:

3-A-7 continued
LD12-00098
BP America Inc.
D002-Characteristic Corrosive Wastes

Proposed pH Requirement

Establishment of an arbitrary range for injection will be counter productive, since it could force operation at significantly different pH ranges than occurs currently. A significant change in pH of an injected stream could cause increased formation of precipitates in the injection zone that might affect the operability of the injection well system. Geochemical interactions may lead to severe reduction in formation permeability or a loss of structural integrity within the formation itself (EPA, Report to Congress on the Injection of Hazardous Waste, May 1985). One common problem is the swelling of clays from contact with the injection fluid. Affected clays can significantly reduce the permeability of the formation. In other instances, polar-organic compounds can be adsorbed by the rocks, particularly silicates, and can significantly reduce the permeability of the formation. Other problems that could result include formation of suspended solids, precipitation and polymerization of the waste fluid and alteration of the injection or confining formation matrix. Waste and formation compatibility problems are specific to the particular formation and waste involved, and the prediction of their compatibility requires site-specific studies. Therefore the treatment standard needs to provide flexibility if the resulting treated waste water is to be suitable for injection.

Because the injected waste must be compatible with the injection zone and injection well materials of construction irrespective of the waste category it is not necessary for BDAT to specify a pH range to protect the environment. Well operators are required to submit a plan which identifies anticipated reaction products to demonstrate that neither the waste nor the reaction products will adversely affect the injection and confining zone (53 FR 28140). The operators must also provide assurance that the materials in the well are compatible with the injected fluid. Corrosion monitoring, generally accomplished by exposing well components or coupons to the waste stream, can, when needed, provide the necessary data for addressing well material compatibility.

Since there are appropriate regulations governing the pH range of disposal of injected fluids and the discharge of wastewater, it is unnecessary and counterproductive to establish a pH range of 6 to 9 for D002 corrosive wastes as a BDAT standard.

C. Allowing UIC permit ranges to supersede BDAT levels to prevent injection operability problems is not sufficient.

To resolve the conflict between the BDAT treatment standard for D002 Acid and Alkaline subcategory and operability of injection wells, EPA proposes to allow the pH range specified in an underground injection control (UIC) permit to supersede the proposed treatment standard range of pH 6 to 9. Because UIC permits do not typically specify a pH range for disposal, this mechanism for relief may be only available to facilities that already have pH ranges specified in their permits.

COMMENT NUMBER: 3-A-7 continued
DOCKET NUMBER: LD12-00098
COMMENTER: BP America Inc
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

BP Chemicals owns and operates six injection wells that inject hazardous waste. Prior to aggregation for treatment, the individual wastewater streams include relatively minor volumes of corrosive waste. The injectate at both facilities typically has a pH between 5 to 6, the pH of acrylonitrile process wastewaters. Neither of BP Chemicals' UIC permits specify a pH range for injection. In order for this relief mechanism to be available to the BP Chemicals' wells, the UIC permits would need to be modified. Permit modifications can take several months to obtain and therefore may not be completed prior to the effective date of the land disposal prohibitions.

The wastewater streams are treated prior to injection to enhance operability of the injection wells. Over the years BP Chemicals has experienced significant changes in the effectiveness of treatment designed to enhance operability based on relatively minor changes in treatment conditions. The wells have not been operated at pH 6 to 9, so there is uncertainty about the effect operating within a 6 to 9 pH range would have on deep well operability.

Although the Agency has correctly identified the need for flexibility within the proposed D002 treatment standard, the solution, i.e. that the BDAT pH range can be superseded by a UIC permit limit, is inadequate to resolve conflicts between injection well operability concerns and meeting a BDAT standard that could be effective as early as May 8, 1990 (for nonwastewaters).

COMMENT NUMBER: 3-A-7
DOCKET NUMBER: LD12-00098
COMMENTER: BP America Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency agrees with the points made by this commenter. The Agency received many comments indicating that the proposed 6-9 pH requirement is not appropriate for injection into certain formations. Other commenters have noted that the 6-9 pH requirement would cause operational problems, such as plugging in underground injection wells. Many injection wells operate at a pH of less than 6 so metals do not precipitate out of solution and cause plugging. Additionally, a pH that is out of the 6-9 range is often specified in Underground Injection Control (UIC) permits to ensure that injected fluid flows properly through the injection zone without plugging. The Agency believes the pH range for proper operation of an injection well should be determined on a case by case basis through UIC permits or based on the operators knowledge of the injection well.

The Agency agrees with the points made by these commenters. The Agency believes that existing regulatory requirements such as NPDES, POTW, and UIC permits, ground-water monitoring and leachate collection are sufficient to control many of the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes it is appropriate to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a

COMMENT NUMBER: 3-A-7 (continued)
DOCKET NUMBER: LD12-00098
COMMENTER: BP America Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number:

3-A-8

Docket Number:

LD12-00130

Commenter:

Wayne Disposal Inc

Issue:

D002-Characteristic Corrosive Wastes

Subissue:

Proposed pH Requirement

Comment:

D002 . CORROSIVE WASTES (Acidic/Basic)

The hazardous waste characterization range is $\text{pH} < 2$ or $\text{pH} > 12.5$. The much narrower proposed range for treatment, $6 < \text{pH} < 9$ is unrealistically narrow. Massive process changes will be required at stabilization-fixation facilities with no environmental advantage gained.

Basic (alkaline) D002 waste streams and many treatment residues from processing of other characteristic wastes would require pH adjustment. Treatment to bring their pH down to the range $6 < \text{pH} < 9$ requires the introduction of acids. This practice would be very difficult, costly, impractical, dangerous and environmentally unsound for the following reasons:

- a) Difficult: In stabilization processes the mixture of the waste and dusts containing lime/silicate mixtures gives rise to pozzolanic reactions (cementation). Physical mixing of the stabilized wastes to introduce acids will accelerate solidification rates in an uncontrolled manner risking permanent damage to or destruction of equipment.
- b) Costly: Acids such as sulfuric will have to be purchased and stored. Permit modifications will be required for process changes.
- c) Impractical: Acid introduction is counterproductive to stabilization. Acids will break the matrix of the solidifying mixture by generation of carbon dioxide bubbles and destruction of the encapsulation medium. This may lead to leaching of other heavy metals that are typically present in such waste streams.
- d) Health and Environmental Concerns: Wastes are complex mixtures of many constituents, some of which may produce harmful by-products upon mixing with acid. An inestimable and unnecessary hidden risk to human life and the environment is taken when wastes undergo a sudden lowering of pH due to surface reactions or overtreatment.

The neutralization of acidic waste to achieve pH in the range $6 < \text{pH} < 9$ requires in-tank liquid treatment with caustic

Comment Number:

3-A-8CONTINUED

Docket Number:

LD12-00130

Commenter:

Wayne Desposal Inc

Issue:

D002-Characteristic Corrosive Wastes

Subissue:

Proposed pH Requirement

Comment:

materials. This is currently conducted at fixation plants using cement kiln dust or lime dusts which have pH buffering capacities at $\text{pH} > 9.0$. A treatment BDAT pH range consistent with that used for waste characterization would be the optimal situation. However, the expanded treatment range of $8 < \text{pH} < 12$ would be an alternative amenable to solidification system operating conditions.

COMMENT NUMBER: 3-A-8
DOCKET NUMBER: LD12-00130
COMMENTER: Wayne Disposal Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

Cost is not a consideration when determining BDAT. However, the Agency agrees with the other points made by this commenter. The Agency received many comments on the affect of the proposed 6-9 pH requirement on stabilization. Some commenters noted that the 6-9 pH requirement would prohibit the optimum treatment of metals in a waste stream. Waste characterization data shows that many D002 wastes also have metal constituents. A pH of about 10 is optimum for removal of many metals and subsequent stabilization. By proposing a 6-9 pH requirement, the Agency did not intent to interfere with pH requirements for other necessary components of treatment trains.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control many of the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes it is more appropriate to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a

COMMENT NUMBER: 3-A-8 (continued)
DOCKET NUMBER: LD12-00130
COMMENTER: Wayne Disposal Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number:

3-A-9

Docket Number:

LD12-00129

Commenter:

Olin Chemicals

Issue:

D002-Characteristic Corrosive Wastes

Subissue:

Proposed pH Requirement

Comment:

D002 Acid and Alkaline Subcategory (III.A.4.c.(i))

Olin takes great exception with the Agency proposal of Neutralization to 6 to 9 pH and Insoluble Salts as the BDAT for the D002 Acid and Alkaline Subcategory. These wastes are usually treated in wastewater treatment plants or by mixing in pipes associated either with NPDES permits (or state equivalent) or POTW discharges. Some wastewater

treatment facilities have surface impoundments that are associated with the unit that are not RCRA regulated units. We believe that Office of Solid Waste and Emergency Response (OSWER) is overstepping its authority by setting discharge criteria and standards (effluent guidelines) which belong in the water division.

Regulated hazardous wastes are characteristic for pH less than 2.0 and greater than 12.5. The Agency has not substantiated any threat to human health or the environment for wastes between 2.0 and 12.5. As a point of fact, many food substances, both natural and manmade have a pH between 2 and 12.5. Carbonated soft drinks have a pH of about 2.5 and oranges have a similar, if not a lower pH. Is it the Agency's determination that these two foods represent a threat to human health or the environment?

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3-A-9 continued
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Furthermore, by setting the neutralization pH to 6-9, OSWER has removed all flexibility from the water division's ability and the states' ability to regulate pH neutralization systems. Olin has several facilities that have NPDES/SPDES permits that allow pH neutralization to as low as 4.5 prior to discharge. Is it the OSWER position that these permits are now invalid, and that effective May 8, 1990 these surface impoundments no longer be able to operate?

Also, several Olin facilities, as well as other company's facilities that we are aware of, use surface impoundments as intermediate storage for wastewaters that have a pH between 3 and 10. These units normally act as holding ponds prior to final pH adjustment and discharge, or for accumulation for batch treatment. These units receive neutralized corrosive wastes (D002 wastes and wastewaters) on a routine basis. USEPA's proposed land disposal restrictions would immediately invalidate use of these units which are normally part of a NPDES/SPDES regulated and permitted facility.

An additional problem is surface impoundments downstream of NPDES/POTW treatment units yet prior to discharge which are used either for accumulation prior to

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3-A-9 continued
LD12-00129
Olin Chemicals

D002-Characteristic Corrosive Wastes

Proposed pH Requirement

discharge or as emergency basins. These impoundments sometimes contain wastewater which is out of the 6-9 pH range because of process upsets in the treatment plants, other allowable discharge limitations (see above) or the impoundments are being used as general mixing ponds for batch treatment processes. The OSWER determination of a 6-9 pH range will restrict use of these impoundments which are regulated (NPDES/POTW) units without taking into account their particular uses.

For the above reasons, Olin recommends that the treatment standard for the D002 Acid and Alkaline Subcategory be "Neutralization to: $2 < \text{pH} < 12.5$."

COMMENT NUMBER: 3-A-9
DOCKET NUMBER: LD12-00129
COMMENTER: Olin Chemicals
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenters. EPA solicited comments pertaining to the proposed 6-9 pH requirement for D002 acid and alkaline wastes. The Agency received many comments indicating that the proposed 6-9 pH requirement would cause major disruptions in the operations of existing wastewater treatment systems. For example, every surface impoundment receiving commingled wastes, one of which was D002 corrosive at the point of generation, would be in violation of the treatment standard if the commingled waste stream was outside of the 6-9 pH range. This would effect thousands of units, most of which are Subtitle D units and hence not presently affected by RCRA Subtitle C.

The Agency believes that existing regulating requirements such as NPDES and POTW permits, groundwater monitoring and leachate collection are sufficient to control many of the factors which cause the Agency to initially propose to 6-9 pH requirement. Therefore, the Agency believes that it is more appropriate to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A-10
DOCKET NUMBER: LD12-00128
COMMENTS: VULCAN MATERIALS COMPANY
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

EPA is proposing the treatment standard for the D002 Acid Subcategories as "Base Neutralization to pH 6-9 and Insoluble Salts" and "Acid Neutralization to pH 6-9 and Insoluble Salts" for the D002 Alkaline Subcategory. The Agency has indicated the range of pH 6-9 because this matches the buffering of natural aquatic systems based on carbonate/bicarbonate pH relationship [i.e., pH 5.5 and 8.5 as the pH levels defining acidity and alkalinity in an aqueous environmental sample.]

What the proposal fails to take into consideration in using this analogy is that in an aquatic environment, one is usually dealing with the carbonate/bicarbonate buffer system which levels out minor additions of either acid or base to the system and consequently, the ecosystem tends to maintain a rather narrow pH range. This is not the case described in the proposal relative to the neutralization of an acid with a base, e.g. neutralizing sulfuric acid with sodium hydroxide. In this type of system, there is no buffering capacity and it can be quite difficult to maintain the pH of the system within the bounds of pH 6-9. Relative small additions of either an acid or a base can dramatically change the pH of an unbuffered system.

In addition to the technical problems perceived to exist with the pH 6-9 concept for the neutralization of D002 corrosive wastes, the issue of establishing treatment standards at levels below the characteristic of the particular waste is also of concern. As said above, Vulcan does not support the Agency's position that it has

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Commenter:

Issue:

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3-A-10 continued
LD12-00128
Vulcan Materials Company

D002-Characteristic Corrosive Wastes

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the right to establish a treatment standard below the characteristic level. A material which does not meet the minimum qualification of the characteristic is not considered a hazardous waste and the Agency no longer has RCRA jurisdiction over the material as a hazardous waste. It may still be a solid waste but by definition, it is no longer a hazardous waste.

The EPA did note, however, that a pH range of 6-9 may not be appropriate for deep well injection into certain formations. Vulcan agrees with this observation and in the operation of deep well injection systems, it is not uncommon to inject waste acid to "acidize" a well into which alkaline solids have been injected.

In summary, Vulcan does not support the imposition of a treatment standard which would require the attainment of pH 6-9 treatment residuals and has very serious reservations regarding the blanket imposition of the generation of insoluble salts from the neutralization process. Most facilities which operate under a NPDES permit are required to maintain their aqueous discharges within the range of pH 6-9 and often attain this goal by the operation of buffered systems. It is unnecessary that the OSW impose a similar requirement on the neutralization of corrosive

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3-A-10 Continued

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Commenter:

Vulcan Materials Company

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Comment:

hazardous wastes. Should the generator/treater wish to discharge treated corrosive wastes to navigable waters, they must already meet the pH 6-9 criterion. Since deep well injection systems operate in formations generally far removed from sources of drinking water, it does not serve a useful purpose to establish a pH 6-9 limitation on the treatment residuals from the treatment of D002 characteristic wastes.

COMMENT NUMBER: 3-A-10
DOCKET NUMBER: LD12-00128
COMMENTER: Vulcan Materials Company
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges agrees with the points made by this commenter. The Agency received many comments indicating that the proposed 6-9 pH requirement would cause operational problems, such as plugging in underground injection wells. Many injection wells operate at a pH of less than 6 so metals do not precipitate out of solution and cause plugging. A pH that is out of the 6-9 range is often specified in Underground Injection Control (UIC) permits to ensure that injected fluid flows properly through the injection zone without plugging. The Agency believes that pH requirements for an injection well should be decided on a case-by-case basis through UIC permits or based on the operator's knowledge of the injection well.

The Agency believes that existing regulatory requirements such as NPDES and FOTW permits, groundwater monitoring, and leachate collection are sufficient to control many of the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes it is more appropriate to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a

COMMENT NUMBER: 3-A-10(continued)
DOCKET NUMBER: LD12-00128
COMMENTER: Vulcan Materials Company
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number

3-A-11

Docket Number

LD12-00116

Commenter

Monsanto

Issue

D002-Characteristic Corrosive Wastes

Subissue

Proposed pH Requirement

Comment

The following comments reflect observations derived from Monsanto operations. The comments reflect further on the inappropriateness of the pH 6-9 BDAT range.

1. Monsanto operates a number of injection wells which may be subject to the proposed BDAT for D002 wastes. At two locations, the pH of injected wastes is maintained well below the proposed BDAT pH limit of 6, in part to avoid solids precipitation/generation which would result in pluggage of the injection zone. (Monsanto operates or has planned to operate at a pH above 2.0 to meet expected land disposal restrictions.)

- a. At one location, a recent process change was implemented which reduced the organic waste discharged to the injection wells by 80,000 pounds per year. However, this pro-active waste elimination effort highlighted the importance of careful pH control as this waste is known to generate a difficult-to-handle precipitate at a pH greater than 3. The attached graph (Attachment B) clearly shows the formation of solids at an elevated pH. Compounding this obstacle is a pH control challenge which is significantly more difficult at a

pH between 4 and 9 due to the small quantity of alkaline material required to dramatically change pH in this range. This pH control phenomenon is illustrated in Attachment C and is typical of such acid titration curves. The pH of such solutions will rise dramatically at a particular pH breakpoint. The result is an unacceptable threat to the reliable operation of the injection well system due to plugging.

In the above example significant amounts of inorganic salts are injected deep into an appropriate injection zone where they pose no threat to human health or the environment. Alternatively, adjustment to pH of 6 or greater in such a manner as to form an insoluble salt would generate very significant amounts of these inorganic salts (requiring pretreatment to remove trace organics) requiring landfilling, a practice less protective of either human health or the environment.

- b. At the second location, non-hazardous waste is injected at a pH generally between 2.5 and 3.5. These wells have operated trouble free at these pHs with no solids problems for over 25 years. On one occasion, due to pH control problems, the pH temporarily increased to the 4 to 6 range. At these pHs biological activity in the injection well feed pond generated solids which posed a threat of pluggage in the injection zone. Similar solids generation was also likely in the injection formation itself, thus increasing the potential for pluggage.

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3-A-11 Continued
LD12-00116
Monsanto

D002-Characteristic Corrosive Wastes

Proposed pH Requirement

In addition, the low pH associated with this waste stream is due to organic and nitric acids. Salts of these acids are generally soluble and therefore cannot be removed from the injected waste by precipitation. Addition of alkaline materials would therefore add to the total quantity of salts to be injected.

2. Some injection zones for deep injection wells (including that underlying one plant discussed above) contain clays which are sensitive to low-salinity waters or high pH fluids. The resultant dispersion and/or swelling of such clays can cause pluggage of the formation, making the well inoperable.
3. Confirming the above concerns, quoting from Chapter 5, "Wastewater Characteristics," of "An Introduction to the Technology of Subsurface Wastewater Injection" EPA-600/2-77-240; U.S. Environmental Protection Agency, Ada, OK; December 1977; pp. 163 and 176-177:

"Changes in wastewater pH can initiate precipitation of dissolved salts causing plugging of formation pores....

An increase in pH of water in the formation pores can also cause loss of permeability in formations that contain so-called 'sensitive' clays (Hughes, 1950; Baptist and Sweeney, 1955)....

Bacteria present in injected wastewater may themselves cause corrosion or plugging of conduits and reservoir rocks.... Bacteria may also promote reactions within the wastewater that may change the wastewater chemistry and form precipitates or gases....

The microorganisms mentioned as causing microbiological corrosion can grow into sufficiently large masses to cause plugging.... In addition, algae may grow in fresh-water systems.... Fresh-water algae...may serve as a source of food for bacteria...."

Thus, pluggage can also be caused by bacterial action. Growth of biological slimes can cause reduced injection efficiency and eventually, total pluggage of the injection zone.

As described above, defining BDAT as adjustment of pH to between 6 and 9 provides no benefit to either human health or the environment. To the contrary, in both examples cited above, the environmental risk would increase due to likely adverse impacts on reliable injection well operation.

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3-A-11 continued

Docket Number

LD12-00116

Commenter

Monsanto

Issue

D002-Characteristic Corrosive Wastes

Subissue

Proposed pH Requirement

Comment

One outcome of establishing pH 6-9 as BDAT would invariably be that some generators would be forced to neutralize wastewaters to this pH range to meet BDAT, but then to readjust pH as necessary to prevent the very real adverse operating problems discussed. Such an outcome surely is not within the intent of the pollution prevention objectives pursued by the Agency.

EPA's basis for selecting the BDAT range of 6-9 for pH is based in part on the "buffering of natural aquatic systems based on carbonate/bicarbonate pH relationship (i.e., pH 5.5 and 8.5...)." 54 FR 48423/1. Discharges to fresh water ecosystems, and protection of these ecosystems, is regulated under the Clean Water Act. The pH range of 6-9 is already essentially universally established for NPDES and POTW discharges, so that the Agency does not need to consider a redundant standard for D002 wastewaters under RCRA.

Monsanto believes BDAT for D002 wastes (for either the Acid Subcategory or the Alkaline Subcategory) should be changed to reflect a pH range of 2.0 to 12.5.

This is specifically relevant to wastes which are corrosive (D002) and EP Toxicity (EPT) for metals. For non-wastewaters, BDAT for metals is proposed as constituent concentrations in the waste extract. One step stabilization often is the only treatment required to meet the EPT treatment standard and render the waste non-corrosive (by virtue of being solid). However BDAT for corrosive wastes is proposed as neutralization to 6-9 pH and insoluble salts. This extra step must be done before stabilizing. This may not be too onerous if the stabilizing agent is the same as the neutralizing agent which generates insoluble salts (ie. lime). This could require an intermediate stop at 6-9 pH before proceeding with stabilization (which could raise the pH to >9 before solidification). This neutralization requirement would be extremely onerous where the stabilization and neutralization agent is not the same and with very little if any benefit gained. In some cases, stabilization processes could be rendered ineffective in meeting EPT treatment standards.

For wastewater, EP Toxicity BDAT for metals is an effluent concentration based upon chemical precipitation. At a minimum this neutralization requirement has the potential to waste natural resources since chemical precipitation may require readjusting the pH to >9 or to <6 to obtain the required metal precipitation. In some cases the treatment standard may be unobtainable with the addition of acid/base which generate insoluble salts.

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3-A-11 continued
LD12-00116
Monsanto

D002-Characteristic Corrosive Wastes

Proposed pH Requirement

3. A D002 stream (pH < 2) is 40 gpm, > 1% TOC. It is neutralized in process to a pH of 3-4, but kept on the acid side to prevent algae formation in the equalization impoundment. It is subsequently deepwell injected with other wastes at pH 3-3.5, a pH designed to prevent precipitate blockage of the receiving formation.
4. A D002 stream (pH < 2) of 60-80 gpm from one process is neutralized to pH 2-4 by combining with another high-pH stream of 300 gpm.

The resultant stream is kept at pH 3.5-4. Organic buffering agents are present, so that neutralization to pH 6-9 would consume large quantities of mineral acids (contrary to pollution prevention principles). In addition, 160,000 lbs/day of insoluble salts would be generated for subsequent disposal, could cause potential problems due to well blockage. Above a pH of 4 or 5, biological activity will cause algae growth in the equalization pond, require use of biocides (again contrary to pollution prevention principles). The natural pH of the receiving formation is on the acid side of neutral, pH 4.5-6.

COMMENT NUMBER: 3-A-11
DOCKET NUMBER: LD12-00116
COMMENTER: Monsanto
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency agrees with the commenter that the proposed 6-9 pH requirement would not be appropriate for injection into certain formations. This commenter as well as many others noted that the 6-9 pH requirement would cause problems, such as plugging in underground injection wells. Many injection wells operate at a pH of less than 6 so metals do not precipitate out of solution and cause plugging. A pH that is out of the 6-9 range is often specified in Underground Injection Control (UIC) permits to ensure that injected fluid flows properly through the injection zone without plugging. The Agency believes the pH range for proper operation of an injection well should be determined on a case by case basis through UIC permits or based on the operator's knowledge of the injection well. The Agency also agrees that many D002 wastes also have metal constituents. A pH of about 10 is optimum for removal of many metals and subsequent stabilization. By proposing a 6-9 pH requirement, the Agency did not intend to interfere with pH requirements for other necessary components of treatment trains.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring and leachate collection are sufficient to control many of the factors which cause the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes it is more appropriate to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation

COMMENT NUMBER: 3-A-11 (continued)
DOCKET NUMBER: LD12-00116
COMMENTER: Monsanto
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

(DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3-A-12

Docket Number LD12-00113

Commenter

Michigan Disposal Inc.

Issue

D002-Characteristic Corrosive Wastes

Subissue

Proposed pH Requirement

Comment

D002 CORROSIVE WASTES (Acidic/Basic)

The hazardous waste characterization range is $\text{pH} < 2$ or $\text{pH} > 12.5$. The much narrower proposed range for treatment, $6 < \text{pH} < 9$ is unrealistically narrow. Massive process changes will be required at stabilization-fixation facilities with no environmental advantage gained.

Basic (alkaline) D002 waste streams and many treatment residues from processing of other characteristic wastes would require pH adjustment. Treatment to bring their pH down to the range $6 < \text{pH} < 9$ requires the introduction of acids. This practice would be very difficult, costly, impractical, dangerous and environmentally unsound for the following reasons:

- a) Difficult: In stabilization processes the mixture of the waste and dusts containing lime/silicate mixtures gives rise to pozzolanic reactions (cementation). Physical mixing of the stabilized wastes to introduce acids will accelerate solidification rates in an uncontrolled manner risking permanent damage to or destruction of equipment.
- b) Costly: Acids such as sulfuric will have to be purchased and stored. Permit modifications will be required for process changes.
- c) Impractical: Acid introduction is counterproductive to stabilization. Acids will break the matrix of the solidifying mixture by generation of carbon dioxide bubbles and destruction of the encapsulation medium. This may lead to leaching of other heavy metals that are typically present in such waste streams.
- d) Health and Environmental Concerns: Wastes are complex mixtures of many constituents, some of which may produce harmful by-products upon mixing with acid. An inestimable and unnecessary hidden risk to human life and the environment is taken when wastes

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Docket Number:

Commenter:

Issue:

Subissue:

Comment:

3-A-12 continued

LD12-00113

Michigan Disposal Inc

D002-Characteristic Corrosive Wastes

Proposed pH Requirement

undergo a sudden lowering of pH due to surface reactions or overtreatment.

The neutralization of acidic waste to achieve pH in the range $6 < \text{pH} < 9$ requires in-tank liquid treatment with caustic materials. This is currently conducted at fixation plants using cement kiln dust or lime dusts which have pH buffering capacities at $\text{pH} > 9.0$. A treatment BDAT pH range consistent with that used for waste characterization would be the optimal situation. However, the expanded treatment range of $8 < \text{pH} < 12$ would be an alternative amenable to solidification system operating conditions.

COMMENT NUMBER: 3-A-12
DOCKET NUMBER: LD12-00113
COMMENTER: Wayne Disposal Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

Cost is not a consideration when determining BDAT. However, the Agency agrees with the other points made by this commenter. The Agency received many comments on the affect of the proposed 6-9 pH requirement on stabilization. Some commenters noted that the 6-9 pH requirement would prohibit the optimum treatment of metals in a waste stream. Waste characterization data shows that many D002 wastes also have metal constituents. A pH of about 10 is optimum for removal of many metals and subsequent stabilization. By proposing a 6-9 pH requirement, the Agency did not intent to interfere with pH requirements for other necessary components of treatment trains.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a

COMMENT NUMBER: 3-A-12 (continued)
DOCKET NUMBER: LD12-00113
COMMENTER: Wayne Disposal Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER:

3-A-13

DOCKET NUMBER:

LD12-00094

COMMENTER:

TRICIL

ISSUE:

D002-Characteristic Corrosive Wastes

SUBISSUE:

Proposed pH Requirement

COMMENT:

3. D002 proposed BDAT limit should be broader than pH 6.0-9.0

TESI believes that the BDAT limit for characteristic corrosive wastes should be set at the characteristic level (i.e., 2.0-12.5).

From a technical perspective, TESI would point out that waste acids have long been used (and encouraged to be used) in the treatment of various metal bearing wastewaters. In this scenario one waste is used (in place of commercial available virgin material) to treat another waste. However, the optimum precipitation range for several metals (lead, cadmium, silver, nickel, zinc, copper) is between pH of 9.0-12.0. Thus, U.S. EPA is proposing extremely stringent BDAT limits for the E.P. Toxic metals while imposing pH restrictions which will affect the treatability of many waste streams even to the characteristic level. Consequently, TESI urges U.S. EPA to establish the BDAT level for corrosive wastes at the characteristic level. As an alternative to establishing BDAT at the characteristic level, TESI would urge U.S. EPA to establish BDAT as 6-12.0 thus, allowing for optimum waste treatment utilizing waste acids.

COMMENT NUMBER: 3-A-13
DOCKET NUMBER: LD12-00094
COMMENTER: Tricil
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. Waste characterization data shows that many D002 wastes also have metal constituents. A pH of about 10 is optimum for removal of many metals and subsequent stabilization. By proposing a 6-9 pH requirement, the Agency did not intend to interfere with pH requirements for other necessary components of treatment trains.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A-14
DOCKET NUMBER: LD12-00151
COMMENTS: Gulf Coast Waste Disposal Authority
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

III.A.4.c.(1). D002 Acid and Alkaline Subcategory

EPA has proposed treatment standards for D002 acid and alkaline wastes that consist of neutralization to within the range of pH 6 to 9 using agents that form insoluble salts [II.A.4.c.(1)]. Its rationale for these proposed standards includes: (1) hydronium ions may solubilize metals from clay liners; (2) hazardous constituents in ground waters may be mobilized by pH values below 6 or above 9; (3) this pH range matches the buffering capacity of natural systems; (4) and soluble salts, if improperly managed, could adversely impact fresh water systems. As will be discussed in the following comments, EPA has not conducted a thorough technical analysis of its assumptions, and its proposed standards for D002 alkaline and acid wastes are not only technically infeasible for some wastes, but also may cause adverse environmental impacts.

B. Naturally-occurring soils and ground water have pH values below 6 and above 9.

EPA's proposed pH 6-9 range for corrosive hazardous wastes also ignores the fact that naturally-occurring soils and ground waters have pH values outside this range. For example, the Agency's Monte Carlo ground water model that has been used to develop the proposed revisions to the toxicity characteristic [Background Document for EPA's Composite Landfill Model (EPACML), Public Docket Reference No. TC3N-S0001, July 1988] includes measured ground water pH values representing the nationwide range of pH that can be expected in ground waters. The mean pH value is 6.2 and the standard deviation is 1.28 (based on a normal distribution). Based on EPA's data, 43.8 percent of the naturally-occurring ground water will have a pH of less than 6.

COMMENT NUMBER: 3-A-14
DOCKET NUMBER: LD12-00151
COMMENTER: Gulf Coast Waste Disposal Authority
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency agrees with this commenter that many naturally occurring soils and ground water have pH values outside of the 6-9 pH range. The Agency received many other comments on the proposed 6-9 pH requirement.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3-A-15

Docket Number LD-2-00197

Commenter Sterling Chemical

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed pH Requirement

Comment

2. The Agency's proposed BDAT for D002 (corrosive) acid and alkaline characteristic wastes is technically unsound and needlessly overprotective. The Agency's data base on the D002 acid and alkaline wastes is flawed since it assumes that all D002 wastes that are reported as neutralized meet the proposed BDAT standards.

The Agency has proposed BDAT for acid and alkaline corrosive wastes to be neutralization to a pH of 6 to 9 using agents that form insoluble salts. The Agency has developed arguments to defend this proposal, yet has not conducted a thorough technical analysis of the merits of its assumptions. Consequently, its arguments are inadequate to support the proposed BDAT. CMA has prepared a convincing rebuttal to the Agency proposal. Sterling Chemicals fully supports the CMA comments in this regard and incorporates by reference section XV.H of the CMA comments.

The Agency argues that a pH of 6 to 9 is necessary to protect "aquatic ecosystems." Sterling Chemicals has no argument with this premise, but believes that protection of aquatic ecosystems is best left where Congress intended: with the various regulatory programs established under the authority of the Clean Water Act. The National Pollutant Discharge Elimination System ("NPDES") codified at 40 C.F.R. Part 122 "... requires permits for discharge of pollutants from any point source to waters of the United States." Effluent limitations in NPDES permits always include pH within a prescribed range of 6 to 9. Thus neutralized D002 corrosive wastewaters legally discharged from any point source must have a pH which is protective of aquatic ecosystems.

Indirect discharges to a Publicly Owned Treatment Works ("POTW") are regulated by pretreatment standards established under regulations codified at 40 C.F.R. Part 403. The Agency has established minimum standards to prevent pass-through or interference of the treatment process. Among these national standards is a minimum pH of 5, or even lower in specifically designed systems. The Agency specifically rejected more stringent limitations in general revisions to the pretreatment program. See 53 Fed. Reg. 47,632 (Nov. 23, 1988); 53 Fed. Reg. 40,562 (Oct. 17, 1988).

Comment Number: 3-A-15 (continued)
Docket Number: LD12-0019.7
Commenter: Sterling Chemical
Issue: D002- Characteristic Corrosive Wastes
Subissue: Proposed pH requirement
Comment:

How then, does the direct or indirect discharger maintain effluent pH within narrow limits of 6 to 9, when some neutralized D002 characteristic wastewaters may lie outside this range? Integrated treatment systems provide for further neutralization to the desired range through equalization and mixing with other chemically buffered waters, by trim chemical neutralization with acids or bases, and through biological action prior to discharge. Sterling Chemicals believes that such mechanisms are as equally as protective of water quality as the BDAT proposal.

The Agency also ignores the difficulty in reliably maintaining a pH of 6 to 9. Spent industrial acids and bases are typically unbuffered solutions. Control of pH in a narrow range near neutral is nearly impossible in waters lacking significant bicarbonate buffering. Systems designed to neutralize D002 corrosive wastewaters to the non-hazardous range of 2 to 12.5 are inadequate to maintain pH in a range of 6 to 9. Because of the inadequacy of existing facilities, a national capacity variance is required should the BDAT standard be promulgated.

For example, Sterling Chemicals has a state of the art neutralization system that combines 26 million gallons per year of spent acid with 7.4 million gallons per year of spent caustic. These wastes are spent process materials and are not significantly buffered with bicarbonate alkalinity. The neutralization system provides control within the non-hazardous range ($2 < \text{pH} < 12.5$), but does allow pH variation within this range. This is due to the steep titration curve typical of strong acid/strong base neutralization. Control of pH within a range of 6 to 9 on such a steep unbuffered titration curve requires multi-stage mixing with complex feed back controls. Currently installed equipment and instrumentation do not operate in this mode.

COMMENT NUMBER: 3-A-15
DOCKET NUMBER: LD12-00197
COMMENTER: Sterling Chemical
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3-A-16

Docket Number WD12-00198

Commenter Department of Energy

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

Additionally, DOE considers the proposal to require the treatment of a corrosive waste to a pH of 6 - 9 to be unnecessarily restrictive. As discussed in greater detail in a comment below, DOE supports treatment standards set at the characteristic levels. Under the proposed approach, a waste stream with a pH of 2.1 would require no treatment but a waste stream with a pH of 1.9 would require treatment to obtain a pH of between 6 and 9. However, both the treated and untreated waste streams would be considered to present an acceptable level of risk to the public. The argument made by the EPA is that the cost associated with raising the pH of the solution is not significant; the EPA uses an example that only 12 pounds of sodium hydroxide would be required to neutralize a gallon of concentrated sulfuric acid to a pH of 7. However, this example fails to recognize that the neutralization endpoint can be exceeded by as little as 1 pound of sodium hydroxide, causing the pH to exceed the upper limit proposed and potentially requiring additional neutralization with an acid. Based on the above considerations, the Department believes that the option of setting treatment standards for corrosive characteristic wastes at the characteristic levels should be adopted.

If the existing characteristic range for corrosivity is not implemented, DOE asserts that a pH range of 5 - 10 could more easily be achieved. This range is more readily attainable as can be shown on a standard pH titration chart. In a naturally occurring environment, soils can be found in pH ranges of 9 - 11, for example, the pH of soil in southeast Washington state fall within this range. Also, many soils in other areas of the country have pH's in the range of 5 - 10.

COMMENT NUMBER: 3-A-16
DOCKET NUMBER: LD12-00199
COMMENTER: Department of Energy
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency agrees with this commenter that the treatment standard for D002 wastes should be at the characteristic level. The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Consent Number 3-A-17

Docket Number L012-00242

Commenter Merck & Co., Inc.

Issue: D002: Characteristic Corrosive Wastes

Subissue: Proposed pH requirement

Comments:

Regulations already restrict pH ranges into rivers, POTWs, and other treatment plants and this treatment standard would be overly restrictive. Furthermore, the Agency has stated that disposal by underground injection of wastes in this pH range may not be appropriate in some formations.

COMMENT NUMBER: 3-A-17
DOCKET NUMBER: LD12-00242
COMMENTER: Merck & Co., Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by the commenter. The Agency received many comments indicating that the proposed 6-9 pH requirement would not be appropriate for injection into certain formations. Many commenters indicated that the proposed 6-9 pH requirement would cause operational problems, such as plugging in underground injection wells. Many injection wells operate at a pH of less than 6 so metals do not precipitate out of solution and cause plugging. A pH that is out of the 6-9 range is often specified in Underground Injection Control (UIC) permits to ensure that injected fluid flows properly through the injection zone without plugging. The Agency believes the pH range for proper operation of an injection well should be determined on a case by case basis through UIC permits or based on the operators knowledge of the injection well. The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the

COMMENT NUMBER: 3-A-17(continued)
DOCKET NUMBER: LD12-00242
COMMENTER: Merck & Co., Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Consent Number 3-A-18

Docket Number LD12-00240...

Consentant Amoco Corporation

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comments

The Agency proposes a standard of neutralization to pH 6-9 and insoluble salts for corrosive wastes. The vast majority of corrosive wastes are wastewaters which are treated as part of an aggregated stream at a wastewater treatment facility (subject to NPDES pH restrictions) or sent for deep well injection according to injection permit requirements. Limitations more narrow than the characteristic levels of pH 2-12.5 would serve no useful purpose, but would cause great disruption to industrial facilities which already handle these materials responsibly.

COMMENT NUMBER: 3-A-18
DOCKET NUMBER: LD12-00240
COMMENTER: Amoco Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency agrees with the points made by this commenter. The Agency received many comments indicating that the proposed 6-9 pH requirement would not be appropriate for injection into certain formations. Many commenters indicated that the 6-9 pH requirement would cause operational problems, such as plugging in underground injection wells. Many injection wells operate at a pH of less than 6 so metals do not precipitate out of solution and cause plugging. A pH that is out of the 6-9 range is often specified in Underground Injection Control (UIC) permits to ensure that injected fluid flows properly through the injection zone without plugging. The Agency believes the pH range for proper operation of an injection well should be determined on a case by case basis through UIC permits or based on the operators knowledge of the injection well.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is

COMMENT NUMBER: 3-A-18(continued)
DOCKET NUMBER: LD12-00240
COMMENTER: Amoco Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3-A-19

Docket Number LD12-00189

Commenter DuPont

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed pH Requirement

Comment

- B. DU PONT SUPPORTS THE AGENCY'S RECOGNITION THAT BDAT FOR CORROSIVES THAT ARE DISPOSED BY UNDERGROUND INJECTION SHOULD BE GOVERNED BY THE UIC PERMIT, NOT BDAT STANDARDS ADOPTED FOR SURFACE FACILITIES

Du Pont supports the Agency's proposal that corrosive wastes that are disposed by underground injection should be governed by provisions of the facilities underground injection control (UIC) permit, and not by BDAT standards adopted for surface facilities. Underground injection wells often must maintain an acidic balance to prevent formation of precipitates when the waste contacts injection formation fluids or to prevent "plating out" of certain materials in the formation itself. This acidic balance is most often achieved, for wastewaters, by maintaining the pH of the injected waste at a low level, at or around pH 2, in order to prevent unwanted precipitate formation. Elevated injection pressures, caused by injection formation plugging, are undesirable in that they may lead to fracture of the formation and potential migration of constituents beyond the intended injection zone. In extreme cases, precipitate formation has caused blockage of the formation and the need to abandon the well or seek a different injection zone formation.

Acidization, to remove minor precipitate formation that may be causing elevated injection pressures and to generally "clean-out" the formation in the area of actual injection, is a common practice specifically recognized and regulated by the UIC regulations. To require BDAT levels of pH 6 - 9 for underground injection wells will in many cases result in the shutdown of those wells.

Therefore, Du Pont encourages the Agency to maintain its proposed position regarding the appropriate BDAT for corrosive wastes disposed by underground injection as governed by the relevant UIC permit and not the technically inappropriate pH levels of 6 - 9.

COMMENT NUMBER: 3-A-19
DOCKET NUMBER: LD12-00189
COMMENTER: DuPont
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency agrees with the points made by this commenter. The Agency received many comments indicating that many injection wells operate at a pH of less than 6 so metals do not precipitate out of solution and cause plugging. A pH that is out of the 6-9 range is often specified in Underground Injection Control (UIC) Permits to ensure that injected fluid flows properly through the injection zone without plugging. The Agency believes the pH range for proper operation of an injection well should be determined on a case by case basis through UIC permits or based on the operator's knowledge of the injection well.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A-20
DOCKET NUMBER: LD12-00151
COMMENTS: Gulf Coast Waste Disposal Authority
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

III.A.4.c.(1). D002 Acid and Alkaline Subcategory

EPA has proposed treatment standards for D002 acid and alkaline wastes that consist of neutralization to within the range of pH 6 to 9 using agents that form insoluble salts [III.A.4.c.(1)]. Its rationale for these proposed standards includes: (1) hydronium ions may solubilize metals from clay liners; (2) hazardous constituents in ground waters may be mobilized by pH values below 6 or above 9; (3) this pH range matches the buffering capacity of natural systems; (4) and soluble salts, if improperly managed, could adversely impact fresh water systems. As will be discussed in the following comments, EPA has not conducted a thorough technical analysis of its assumptions, and its proposed standards for D002 alkaline and acid wastes are not only technically infeasible for some wastes, but also may cause adverse environmental impacts.

A. Wastes with pH values as low as 2 do not significantly solubilize metals from clay liners.

With respect to acidic wastes solubilizing metals from clay liners, A 1986 study (Finno, R.J., and Schuber, W.R., *Clay Liner Capability in Waste Disposal Practice*, Journal of Environmental Engineering, 112, 6, American Society of Civil Engineers, pp. 1070-1084, December, 1986) demonstrated that a clay-lined surface impoundment used to store acidic wastewaters containing high metals concentrations (greater than the California List cut-off levels) was highly resistant to any significant migration of metals during its eight-year operating life. Exposure to the acidic wastes did not appreciably alter the permeability and structural characteristics of the clay liner. EP extraction of the upper 15 centimeters (cm) of the clay liner showed metal concentrations in the extract which were all well below the EP toxicity characteristic levels, although slightly greater than the corresponding levels in the natural clay. At the 45 cm depth, the metals concentrations in the EP extract were identical to the background, showing that in eight years of impoundment use the leachable metals had not penetrated to a depth 45 cm below the pond bottom.

This study suggests that acidic, metals-containing wastewaters and solids do not cause significant degradation of the clay's pore structure resulting in increases in liner permeability. These results support EPA's decision to establish a BDAT pH standard

COMMENT NUMBER: 3-A-20 *continued*
DOCKET NUMBER: LD12-00151
COMMENTS: Gulf Coast Waste Disposal Authority
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

of 2 for the California list land disposal restrictions rule. EPA evaluated the effect of acidic wastes on landfill liners when it promulgated the California list rules, and concluded that wastes with pH values above the characteristic level of 2 did not cause excessive increases in permeability or metals migration; there are no data or analyses provided in the current proposal that suggests that the pH range of 6-9 is required to protect the environment from metals migration.

COMMENT NUMBER: 3-A-20
DOCKET NUMBER: LD12-00151
COMMENTER: Gulf Coast Waste Disposal Authority
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

As noted by this commenter, the Agency proposed the 6-9 pH requirement for several reasons including the solubilization of metals from clay liners. The Agency still believes that this is a legitimate concern. However, based on information supplied by this commenter and other commenters, the Agency believes the impact of low pH wastes on clay liners is not significant. The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A-21
DOCKET NUMBER: LD12-00151
COMMENTER: Gulf Coast Waste Disposal Authority
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

III.A.4.c.(1). D002 Acid and Alkaline Subcategory

EPA has proposed treatment standards for D002 acid and alkaline wastes that consist of neutralization to within the range of pH 6 to 9 using agents that form insoluble salts [II.A.4.c.(1)]. Its rationale for these proposed standards includes: (1) hydronium ions may solubilize metals from clay liners; (2) hazardous constituents in ground waters may be mobilized by pH values below 6 or above 9; (3) this pH range matches the buffering capacity of natural systems; (4) and soluble salts, if improperly managed, could adversely impact fresh water systems. As will be discussed in the following comments, EPA has not conducted a thorough technical analysis of its assumptions, and its proposed standards for D002 alkaline and acid wastes are not only technically infeasible for some wastes, but also may cause adverse environmental impacts.

C. Aquatic ecosystems are protected from high and low pH discharge by the Clean Water Act's NPDES permit program. Setting pH limits within treatment facilities is counterproductive to effective treatment management, which often calls for pH values outside of the proposed treatment range for maximum process effectiveness.

With respect to the protection of aquatic ecosystems, the Clean Water Act (CWA) requires that all waste discharges be permitted, and permits always include pH as a parameter, usually with limits in the range from pH 6-9. There is no regulatory need for requiring the pH 6-9 limit on wastewaters that are subject to RCRA: before they are discharged the CWA-based pH limits must be met.

COMMENT NUMBER: 3-A-21
DOCKET NUMBER: LD12-00151
COMMENTER: Gulf Coast Waste Disposal Authority
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by the commenter. The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A- 22
DOCKET NUMBER: LD12-00160
COMMENTER: American Iron and Steel Institute
ISSUE: D002 - Characteristic Corrosive wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

Treatment Standards

AISI is also concerned about several aspects of the treatment standards proposed for various regulated wastes. One concern rests with the inconsistencies that may exist between these treatment requirements and those required under other environmental programs. For example, EPA has proposed a treatment standard for D002 alkaline and acid waste streams which requires neutralization to a range of 6 to 9 pH units. 54 Fed. Reg. at 48515. Under EPA's NPDES program for waste water discharges, some permit holders have pH limitations outside this range to accommodate specific treatment technology requirements, particularly for removal of metals.

COMMENT NUMBER: 3-A-22
DOCKET NUMBER: LD12-00160
COMMENTER: American Iron and Steel Institute
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. Waste characterization data shows that many D002 wastes also have metal constituents. A pH of about 10 is optimum for removal of many metals and subsequent stabilization. By proposing a 6-9 pH requirement, the Agency did not intent to interfere with pH requirements for other necessary components of treatment trains.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A-23
DOCKET NUMBER: LD12-00159
COMMENTS: Waste Management, Inc./Chemical Waste Management, Inc.
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT: v. Deep Well Injection of Corrosive Wastes (54 Fed. Reg. at 48,423)

In its proposal, the Agency acknowledges that specifying BDAT treatment levels requiring neutralization of D002 corrosive wastes to a pH range of 6-9 may create plugging in the injection zone causing in fluid flow restrictions, due to incompatibility between the waste and injection zone formations. 54 Fed. Reg. at 48423. To avoid this dilemma the Agency solicits comment on "whether any pH range specified in an underground injection control permit should supercede the proposed treatment standard of pH 6 to 9." Id.

WMI agrees with the Agency that any pH range necessary to provide compatible operation with injection well formation must supercede the proposed treatment standard of pH 6 to 9. We disagree, however, that the pH range would necessarily be specified in an underground injection control (UIC) permit. All UIC permits do not specify pH and requiring this would subject facilities to unnecessary permit revisions for a condition already inherent to the operation of the facility.

Therefore, WMI urges EPA to promulgate a final standard stating that UIC facilities may follow existing practices with respect to the pH of injected wastes to ensure compatibility with injection zone formations. The pH range for such wastes need not be specified in the permit and shall supercede the treatment standard of neutralization to a pH 6 to 9 for surface disposal of D002 corrosive wastes.

COMMENT NUMBER: 3-A-23
DOCKET NUMBER: LD12-00159
COMMENTER: Waste Management, Inc./Chemical Waste Management, Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

With respect to underground injection the Agency agrees with the commenter that the 6-9 pH requirement is not appropriate for injections into certain formulations. Other commenters have noted that the 6-9 pH requirement would cause operational problems such as plugging in underground injection wells. Many injection wells operate at a pH of less than 6 so metals do not precipitate out of solution and cause plugging. A pH that is out of the 6-9 range is often specified in Underground Injection Control (UIC) permits to ensure that the injected fluid flows properly through the injection zone without plugging. However, as mentioned by this commenter, a pH range is not always specified in the UIC permits. The Agency believes the pH range for proper operation of an injection well should be determined on a case by case basis through UIC permits or based on the operator's knowledge of the injection well. The Agency is therefore, promulgating treatment to pH greater than 2 for D002 acids and pH less than 12.5 for D002 alkaline wastes.

Consent Number 3-A-24

Docket Number LD12-00216.

Consent BP Chemicals

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Consent

3. EPA should establish BDAT as "treatment to remove the characteristic" for corrosive wastes that are deepwell injected and cannot rely on permit conditions.

The Agency correctly recognizes that the pH range of 6 to 9 may not be appropriate for deepwell injection into certain formations (54 FR 48423). Since deepwell injection zones are not near surface aquatic ecosystems, injected fluid need not meet standards intended to protect aquatic systems. In some cases a different pH range may be specified in UIC permits to ensure that injected fluid flows properly through the injection zone without plugging. To resolve the conflict between the BDAT treatment standard for D002 Acid and Alkaline Subcategory and operability of injection wells, EPA proposes to allow the pH range specified in an underground injection control permit to supersede the proposed treatment standard range of pH 6 to 9.

Because UIC permits do not typically specify a pH range for disposal, this mechanism for relief would only be available to the few facilities that already have pH ranges specified in their permits. In order for this relief mechanism to be available to all affected well operations UIC permits would need to be modified. Permit modifications can take months to obtain.

...
Comment Number 3-A-24 (continued)

Docket Number LD12-00216.

Comment BP Chemicals

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

BP Chemicals owns and operates six injection wells that inject hazardous waste. Prior to aggregation for treatment, the individual wastewater streams include relatively minor volumes of corrosive waste. The injectate at both facilities typically has a pH between 5 to 6, the pH of acrylonitrile process wastewaters. Neither UIC permit requires the injectate to be pH 6 to 9 nor specifies pH limits.

The wastewater is treated to improve injectivity. Over the years we have experienced significant changes in injectivity based on relatively minor changes in wastewater conditions. We do not have experience operating at pH 6 to 9, so there is uncertainty about the effect this pH range might have on deepwell operability. A change in pH could adversely affect operability of the well system. Clearly the UIC administrators should have flexibility to set a pH that is compatible with the injection interval should supersede BDAT.

Consent Number 3-A-24 (continued)

Docket Number LD12-00216.

Consent BP Chemicals

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Consent

Since deepwell injected waste must be compatible with the injection zone and injection well materials of construction, it is not necessary for BDAT to specify a pH range to protect the environment. Well operators are required to submit a plan that identifies anticipated reaction products to demonstrate that neither the waste nor the reaction products will adversely affect the injection and confining zone (53 FR 28140). Operators must also provide assurances that the materials in the well are compatible with the injected fluid. In addition, corrosion monitoring is required to ensure well construction material compatibility.

COMMENT NUMBER: 3-A-24
DOCKET NUMBER: LD12-00216
COMMENTER: BP Chemicals
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. The Agency received many comments indicating that the proposed 6-9 pH requirement would cause operational problems, such as plugging in underground injection wells. Many injection wells operate at a pH of less than 6 so metals do not precipitate out of solution and cause plugging. A pH that is out of the 6-9 range is often specified in Underground Injection Control (UIC) permits to ensure that injected fluid flows properly through the injection zone without plugging. The Agency believes the pH range for proper operation of an injection well should be determined on a case by case basis through UIC permits or based on the operators knowledge of the injection well.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A

COMMENT NUMBER: 3-A-24 (continued)
DOCKET NUMBER: LD12-00216
COMMENTER: BP Chemicals
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number: 3-A-25
Docket Number: LD12-00168
Commenter: American Petroleum Institute
Issue: D002 - Characteristic Corrosive Wastes
Subissue: Proposed pH requirements
Comment:

In addition, the proposed BDAT standards for corrosive wastes requiring treatment beyond the characteristic level is based on another erroneous assumption. The Agency is proposing neutralization to a pH between 6 and 9 (resulting in insoluble salt or recovery), as the BDAT method for D002 Alkaline or Acid Wastes. EPA's reason for requiring treatment beyond the characteristic level is to prevent metals in wastes disposed in facilities with clay liners (presumably surface impoundments) from being mobilized. However, due to their size, design and leak detection requirements, the addition of some pH 2 liquid will not affect the overall pH of an impoundment. Additionally, metal bearing wastes will require some form of fixation and thus would be less available to react with other waste acids or bases applied to surface impoundments.

COMMENT NUMBER: 3-A-25
DOCKET NUMBER: LD12-00168
COMMENTER: American Petroleum Institute
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3A-26

Docket Number LD12-00224.

Commenter Texaco

Issue D002: Characteristic Corrosive Wastes

Subject Proposed pH requirement

Comments

In regards to ~~alkaline corrosive~~ waste, once the pH of the material has been adjusted to a level which is non-hazardous, the generator should not be required to treat any further. EPA reasoning that the lower pH 2-6 materials decrease the efficiency of clay liners and would increase the mobility of constituents in groundwater, can be reversed when discussing alkaline materials in the 9-12.5 range which would tend to improve the efficiency of the clay liners and reduce constituent mobility in groundwater. Therefore, the treatment range for pH should be adjusted to 6-12.5.

COMMENT NUMBER: 3-A-26
DOCKET NUMBER: LD12-00224
COMMENTER: Texaco
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency received many comments on the proposed 6-9 pH requirement. The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A-27
DOCKET NUMBER: LD12-00167
COMMENTS: Westinghouse Electric Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

The proposal to require treatment of a corrosive waste to a pH of 6-9 is unnecessarily restrictive and inconsistent with the application of the RCRA characteristic standards. The proposed rule requires that wastes with a pH less than 2 or greater than 12.5 be neutralized to a pH between 6 and 9. However, neutralization would never be required for non-hazardous wastes with a pH between 2 and 6 or between 9 and 12.5.

COMMENT NUMBER: 3-A-27
DOCKET NUMBER: LD12-00167
COMMENTER: Westinghouse Electric Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency received many comments and information on the proposed 6-9 pH requirement. The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3-A-28

Docket Number LD12-00204.

Commenter Util. SW Act. Group / Util Nuclear Waste and Transp., EEI

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comments

E. EPA's Treatment Standards for Corrosive Characteristic Wastes Are Unlawful And Unduly Restrictive

EPA has proposed treatment standards for the acid and alkaline subcategories of corrosive characteristic wastes (waste code D002) of (1) "base neutralization to pH 6-9 and insoluble salts" for the D002 acidic subcategory and (2) "acid neutralization to pH 6-9 and insoluble salts" for the D002 alkaline subcategory. 54 Fed. Reg. at 48422. The Electric Utilities strongly object to these treatment standards because, as is the case with EP toxic characteristic wastes, the Agency is proposing a treatment standard that is more stringent than the corresponding hazardous waste characteristic level.

Comment Number 3-A-28 (continued)

Docket Number LD12-00204.

Commenter Util. SW Act. Group / Util Nuclear Waste & Transp., EET

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

Simply put, a solid waste is considered hazardous for purposes of corrosivity if the waste is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5. See 40 C.F.R. § 261.22. Solid wastes that have a pH greater than 2 or less than 12.5 are not considered hazardous (see 40 C.F.R. § 261.3(d)) and, therefore, are not subject to RCRA's land ban program. The proposed treatment standards for the D002 acid and alkaline subcategories, however, would require base or acid neutralization to a pH range of 6-9. This range is outside the scope of the corrosivity characteristic. As discussed above, nothing in section 3004(m) authorizes EPA to establish treatment standards that are more stringent than the standards that render a waste hazardous in the first place. Consequently, the proposed treatment standards for the D002 acid and alkaline subcategories are not authorized under section 3004(m) and are, in our opinion, unlawful. The Electric Utilities suggest that the proper treatment standard for this subcategory of characteristic waste must not exceed the characteristic of corrosivity; namely, such waste can be treated so that the pH is greater than 2 or less than 12.5.

COMMENT NUMBER: 3-A-28
DOCKET NUMBER: LD12-00204
COMMENTS: Util. SW Act Corp./Util. Nuclear Wastes & Transp. EEI
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency received many comments and information on the proposed 6-9 pH requirement. The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

~~Comment Number~~ 3-A-29

~~Docket Number~~ LP12-00220

~~Comment~~ Green Bay Packaging, Inc.

~~Issue~~ D002: Characteristic Corrosive Wastes

~~Subissue~~ Proposed pH requirement

~~Comment~~

The next item we wish to comment on relates to the proposed requirement to conduct neutralization of Corrosive wastes to within the bounds of pH greater than 6.0 but less than 9.0. As the present form of RCRA works out, one can neutralize a D002 waste to within the bounds of a pH greater than 2.0 and less than 12.5 and render the waste "non-hazardous". Once this has occurred, the generator or treater can then continue the treatment to a more benign pH without the process of treatment necessarily being regulated under RCRA. Thus if one thinks of the process of "elementary neutralization" as bringing the pH of a Corrosive waste to within the bounds of pH >2.0 / <12.5 , subsequent steps of neutralization can occur elsewhere at a given facility using readily available neutralizing agents in more convenient settings without those latter neutralization steps being "treatment" under RCRA. With this proposal, one will have to commit much greater amounts of neutralizing agents to the initial step of "treatment" in order to get within the bounds of a 6.0 to 9.0 pH. This increase in the cost of "elementary neutralization" within the vessel first containing the waste is certainly undesirable where more cost-effective but step-wise treatment can occur.

Even if USEPA were to say that "elementary neutralization" could occur in more than one place in a step-wise fashion at a given facility, it would be most undesirable to bring in the full sweep of RCRA onto more of an operating facility than is necessary by present definitions. We therefore strongly urge USEPA not to require that neutralization have to be carried out all the way to pH bounds as constrictive as 6.0 to 9.0.

COMMENT NUMBER: 3-A-29
DOCKET NUMBER: LD12-00220
COMMENTER: Green Bay Packaging, Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3-A-30

Docket Number LD12-00194.

Commenter Rehm and Haas

Issue D002 - Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

DISCUSSION

1. EPA Should Revise Its Approach To Corrosive Wastewaters.

The treatment standard for corrosive wastes -- pH of 6 to 9 and insoluble salts -- will have the greatest impact on R and H. See 54 Fed. Reg. at 48,424. We urge EPA to revise its approach to corrosive wastewaters as follows:

1. Set the treatment standard at the characteristic parameters -- pH between 2 and 12.5 and no restriction on the formation of soluble salts.

Further, EPA should allow limited excursions to the 6 to 9 pH range, like under NPDES permits.

COMMENT NUMBER: 3-A-30
DOCKET NUMBER: LD12-00194
COMMENTER: Rohm and Haas
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency received many comments and information on the proposed 6-9 pH requirement. The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3-A-31

Docket Number LD12-L0023.

Commenter Racon, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed PH requirement

Comment

1. The requirement to neutralize D002 wastes to pH 6-9 is not satisfactory if the waste is to be sent to deep disposal wells. To avoid plugging, the pH of injected fluids should be acidic. Perhaps a qualification excluding this pH range would be satisfactory if the receiving strata has neutralizing characteristics and it can be demonstrated that the deepwell disposal system is appropriate for acidic waste.

COMMENT NUMBER: 3-A-31
DOCKET NUMBER: LD12-00023
COMMENTER: Racon, Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. The Agency received many comments indicating that the proposed 6-9 pH requirement would cause operational problems, such as plugging in underground injection wells. Many injection wells operate at a pH of less than 6 so metals do not precipitate out of solution and cause plugging. A pH that is out of the 6-9 range is often specified in Underground Injection Control (UIC) permits to ensure that injected fluid flows properly through the injection zone without plugging. The Agency believes that the pH requirement of an injection well should be decided on a case by case basis through UIC permits or based on the operator's knowledge of the injection well.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a

COMMENT NUMBER: 3-A-31(continued)
DOCKET NUMBER: LD12-00023
COMMENTER: Racon, Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3-A-32

Docket Number LD12-00207.

Commenter Rhone-Poulenc

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

The proposed rule represents a wholesale abandonment of a basic RCRA concept as to characteristic wastes, whereby the Agency is essentially treating corrosive wastes as if they were listed. A generator of RCRA corrosive wastes would be required to continue to treat that waste stream to pH of 6-9, almost as if the effluent from primary neutralization were a "derivative" waste stream (See 40 CFR 261.3(c)(2)).

This LDR rule is also incongruous in operation as it would require LDR treatment of a generator of RCRA corrosive wastes, but would impose no such requirement upon a generator of waste having, for instance, a pH of 4 or 11. Such generator could proceed to lawful discharge regardless of LDR restrictions, whereas the RCRA generator would be required to further treat the waste stream to a narrower range.

These LDR regulations also fail to address adequately the economic impact of this rule on industry, particularly a potentially large population of plants which are designed to conduct primary neutralization to a non-RCRA range, and discharge to earthen basins for additional treatment, mixing or impoundment.

Neither do the proposals for corrosive wastes address their full environmental impact. In many cases, materials which are either more acidic or basic than pH 6-9 are important to additional treatment of other constituents. For instance, Rhone-Poulenc Ag Company's Institute, West Virginia Plant operates a centralized wastewater treatment facility, which receives process waste streams from over 20 manufacturing units, as well as from groundwater treatment and landfill runoff and leachate. The waste stream receives primary neutralization in a large tank, before discharge to the Plant's earthen bio-basins, which operate under an aggressive biological treatment ("ABT") system exemption from RCRA requirements. The ABT system treats the wastes to within NPDES permit standards, prior to discharge to the Kanawha River.

Consent Number

3-A - 32 (continued)

Docket Number

LD12-00207

Consent

Rhone-Poulenc

Issue: D002: Characteristic Corrosive Wastes

Subissue: Proposed pH ~~level~~ requirement

Comments

In certain instances, the process waste flow at the plant will warrant that the influent to the bio-basins be more acidic or basic than pH 6-9, to add an extra measure of safety that other waste stream components will be destroyed or otherwise effectively treated. Unless EPA allows such ABT exempt systems to receive LDR wastes, as is suggested below, it is possible that the LDR restrictions could unduly restrict the pH range of influent to the bio-basins, and contribute to an inadvertent exceedance of NPDES limits.

Certainly, it is absurd to risk an actual adverse impact on direct discharge to a river by blindly following restrictive pH rules made applicable to points within a centralized, integrated treatment system. It is equally absurd to have the regulated community comply by treating to pH 6-9, only to re-introduce huge quantities of purchased pH trimming chemicals, when needed waste materials are readily at hand. In fact, any LDR rule which would require wasteful action arbitrarily ignores resource recovery principles, which should be at the heart of RCRA implementation. However, these effects (which are not unique to RPI, and may attend many centralized treatment systems) have not been considered in the proposal.

In these foregoing respects, the regulation is both beyond EPA's authority, does not contain a reviewable determination of hazardousness, is arbitrary in its operation and unsupported by an adequate economic or environmental impact review. We propose that EPA retain the current characteristic distinctions which clearly identify when materials are hazardous and when they are not.

COMMENT NUMBER: 3-A-32
DOCKET NUMBER: LD12-00207
COMMENTS: Rhone-Poulenc
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency received many comments indicating that the proposed pH requirement would cause major disruptions in the operations of existing wastewater treatment systems (such as described by this commenter). For example, every surface impoundment receiving commingled wastes, one of which was D002 corrosive at the point of generation, would be in violation of the treatment standard if the commingled waste stream was outside of the 6-9 pH range. This would effect thousands of units, most of which are Subtitle D units and hence not presently affected by RCRA Subtitle C.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

COMMENT NUMBER: 3-A-33
DOCKET NUMBER: LD12-00159
COMMENTS: Waste Management, Inc./Chemical Waste Management, Inc.
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

4. Specific Waste Codes

a. Treatment Standards for Corrosive Wastes/D002 (54 Fed. Reg. at 48,422-24)

EPA has proposed treatment standards for corrosive wastes (D002) in terms of specific treatment technologies. These standards, as written, are too restrictive when viewed in the context of the actual wastes treated at a commercial hazardous waste treatment facility.

i. Corrosive acid wastes

The proposed standard for D002 corrosive acid wastes is "neutralization with bases to $6 < \text{pH} < 9$ and insoluble salts." While this standard appears reasonable on its face, it would severely impede normal treatment practices for acidic wastes because many of those wastes are contaminated with metals. EPA's proposed standard would in some instances result in less effective treatment than if the standard were revised to account for complex waste matrices. For example, to remove metals, the pH of the waste must be raised to as much as 10, depending on the metals present. (See "Metal Concentration After Filtration," Attachment D). At these pH levels, the metals precipitate and are removed by a filter press. The filter press filtrate is then neutralized with hydrochloric acid. While this above treatment train achieves the end results contemplated by the treatment standard, i.e., a liquid between pH 6 and 9 and insoluble salts,

COMMENT NUMBER: 3-A-33 *continued*
DOCKET NUMBER: LD12-00159
COMMENTS: Waste Management, Inc./Chemical Waste Management, Inc.
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed pH Requirement
COMMENT:

it does not literally meet the treatment standard because the corrosive wastes are treated to a pH greater than 9 and then neutralized to the acceptable range with acid.

Literal compliance with the treatment standard would be absurd, however. It would require neutralization of the acid wastes, followed by alkalization for treatment of metals. To treat the wastes wastes in that manner would not only be pointless, but would actually result in less effective treatment of metals. The Agency should, therefore, change the wording of the treatment standard to require "neutralization to $6 < \text{pH} < 9$ and insoluble salts."

ii. Corrosive Alkaline Wastes

A similar problem arises with the proposed treatment standard for alkaline corrosive wastes which requires "neutralization with acids to $6 < \text{pH} < 9$." Again, the literal wording of the standard conflicts with actual treatment practices. Alkaline wastes often contain metals, and to remove the metals the wastes must be acidified to a low pH by blending with acids; the metals are precipitated and filtered out; and the filter press effluent is neutralized. The standard for alkaline corrosive wastes should be modified to merely require "neutralization to $6 < \text{pH} < 9$."

COMMENT NUMBER: 3-A-33
DOCKET NUMBER: LD12-00159
COMMENTER: Waste Management, Inc./Chemical Waste Management, Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency received many comments indicating that the proposed pH requirement would cause major disruptions in the operations of existing wastewater treatment systems. Commenters such as this one, noted that the 6-9 pH requirement would prohibit the optimum removal of metals in a waste stream. Waste characterization data shows that many D002 wastes also have metal constituents. A pH of about 10 is optimum for removal of many metals and subsequent stabilization. By proposing a 6-9 pH requirement, the Agency did not intent to interfere with pH requirements for other necessary components of treatment trains.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number: 3-A-34

Docket Number: LD12-00179

Commenter: Dow Chemical

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Proposed pH requirement

Comment:

XXVI. EPA SHOULD REQUIRE THAT CORROSIVE WASTES BE NEUTRALIZED TO A pH RANGE OF 2.0 TO 12.5, RATHER THAN A pH RANGE OF 6 TO 9.

54 Fed. Reg. 48,422 column 2

- A. EPA has proposed treatment standards for corrosive wastes that would require such wastes to be neutralized beyond the point where they no longer exhibit a characteristic of hazardous waste (i.e., > pH 2.0 and < pH 12.5) to a pH range of 6 to 9. 54 Fed. Reg. 48,424. Similarly, EPA has proposed treatment standards for corrosive wastes that would require treatment to a pH range of 6 to 9, even though wastes with pH levels below 12.5 are no longer considered hazardous wastes subject to Subtitle C jurisdiction. As discussed in Comment XVIII, (page 14), EPA does not have legal authority under RCRA to require treatment of characteristic wastes, including corrosive wastes, beyond the point where they no longer exhibit a characteristic of hazardous waste. Moreover, such regulation, even if it were legally permissible, would lead to significant implementation problems. Therefore, EPA should require that corrosive wastes be neutralized to a pH range of 2.0 to 12.5, rather than a pH range of 6.0 to 9.0.

Requiring treatment beyond the characteristic levels is particularly inappropriate in the context of corrosive hazardous wastes. At some of Dow's facilities, for example, wastewater treatment plant sludges which are derived in part from corrosive hazardous wastes, are treated for environmentally beneficial reasons to a pH range of 10.5 to 11.0. These sludges are initially generated with a pH in the range of 6.8 to 7.2 because the wastewater treatment plant relies on biological activity that cannot operate outside this range. When the sludges are removed from the wastewater treatment plant, lime is added to adjust the pH to 10.5 to 11.0. This practice is necessary to curtail the biological activity and thus reduce the odor associated with the sludge. EPA has recognized elsewhere in the Third Third proposal that strong odors may pose serious environmental or nuisance concerns. See 54 Fed. Reg. 48,417. Moreover, the Agency has previously recognized that environmental risks should be considered in establishing treatment standards for restricted hazardous wastes. 51 Fed. Reg. 40,592-93 (November 7, 1986). Thus, EPA should establish treatment standards for corrosive hazardous wastes that allow continued use of lime addition to sludges. Specifically, EPA should allow corrosive wastes to be land disposed as long as they have been treated so that they no longer exhibit the characteristic of corrosivity.

Comment Number: 3-A-34 (continued)

Docket Number: LD12-00179

Commenter: Dow Chemical

Issue: D002- Characteristic Corrosive Wastes

Subissue: Proposed pH requirement

Comment:

- B. One Dow facility operates a nonhazardous biological treatment plant for wastewater which may have been hazardous at the point of generation due to corrosivity. The wastewater is treated to a pH greater than 2 and less than 12.5 in the pipeline to the treatment system, with the actual influent pH being adjusted based on the needs of the treatment lagoons. The setpoint range is from 8.5 to 10.5 pH.

During the biodegradation process, degraded organic compounds yield carbon which exits the process as carbon dioxide. The carbon dioxide readily forms carbonic acid, reducing the overall lagoon pH to an optimum 7.5. This naturally occurring process optimizes biological activity without the need for direct neutralization.

Requiring that such influent meet a 6-9 pH standard would result in reduced effectiveness of the desired biological treatment at significantly increased costs without any additional protection to human health or the environment.

- C. The practical, operational concerns discussed below were realized and were at least part of the reason for the precise pH ranges used for the characteristic of corrosivity. The pH of a saturated lime water stream is about 12.4 (CRC Handbook of Chemistry and Physics 54th Edition, 1973, p D-114). A typical method to increase the pH of biological surface impoundments is to mix into either the influent, or the pond, water saturated with lime. This rule would require expensive additional equipment, the modification of environmentally protective NPDES treatment ponds, for unknown or nonexistent benefits.

One practical operational consideration which the proposed LDR treatment standard for corrosives (6 -- 9 pH) does not meet is the adjustment of pH in surface impoundments. If the pH of liquids used to adjust pH in such surface impoundments is restricted to the 6 to 9 pH range, the volume of the adjusting liquid will be dramatically increased. The amount of waste salt could also be dramatically increased.

This decrease in the pH of the allowable adjusting liquids literally has an exponential increase in the volume of adjusting liquids consumed. All of these increased adjusting liquids becomes wastes. Therefore, this change results in an exponential increase in at least one component of solid, and perhaps hazardous wastes.

Comment Number 3-A-34 (continued)

Docket Number LD12-00179

Commenter Dow Chemical

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed pH Requirement

Comment

For example, one Dow facility operates a nonhazardous biological treatment plant which treats about 100,000 gpm of nonhazardous wastewater. The plant consists of a series of surface impoundments. Currently, the plant receives wastewater which may have been hazardous by corrosivity characteristic at the point of generation. The biological activity is optimized only in a narrow pH range. The volume and pH of the incoming streams vary due to manufacturing plant operation changes (shutdowns, changes in product composition or volume, process modifications, outside temperature and the like). Some of the wastewater pH is needed to neutralize other wastewater streams and adjust the plant's impoundments to the optimize pH range. Imposing a narrower pH range on the allowable incoming streams could require neutralization of needed acidity or basicity before the stream entered the surface impoundment requiring the addition of acidity or basicity to the surface impoundment to replace that removed by this narrower pH range.

To illustrate this point, assume that a biological wastewater plant, similar to the one described above, was operating optimally, but now a 63 gpm stream is required to reduce its pH from 12.5 to 9. The stream would now provide about 0.03 percent of the effectiveness it had before. An additional 100,000 gpm of the most basic stream allowed to be placed in the wastewater impoundment (pH of 9) would have to also be added to achieve the same optimum pH in the surface impoundments. Note that this would double the volume of wastewater being treated. A slightly larger effect would occur on the acidic side of the proposed LDR.

Another concern related to this type of operational change is the increase in salt production. If one assumed ideal solutions, and the use of NaOH and HCl; the decrease in pH would cause an increase in salt (NaCl) of 130 tons per year.

- D. There is another, larger concern with this Dow facility which EPA did not address. This concern is the fact that the optimum operational pH for the facility's surface impoundments varies between 8.5 and 10.5. With the NPDES permit limits very close to optimum operation, restricting the pH of the surface impoundments to a pH range of 6 to 9 could make noncompliance unavoidable.

COMMENT NUMBER: 3-A-34
DOCKET NUMBER: LD12-00179
COMMENTER: Dow Chemical
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency received many comments such as this one, indicating that the proposed pH requirement would cause major disruptions in the operations of existing wastewater treatment systems. For example, every surface impoundment or injection well receiving commingled wastes, one of which was D002 corrosive at the point of generation, would be in violation of the treatment standard if the commingled waste stream was outside of the 6-9 pH range. This would effect thousands of units, most of which are Subtitle D units and hence not presently affected by RCRA Subtitle C. Additionally, as noted by this commenter, the proposed 6-9 pH requirement would adversely affect other aspects of treatment systems, such as biological activity.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A

COMMENT NUMBER: 3-A-34
DOCKET NUMBER: LD12-00179
COMMENTER: Dow Chemical
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3-A-35

Docket Number LD12-00196

Commenter SCM Chemicals, Inc.

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

B. EPA's Proposed Treatment Standard For Acidic and Alkaline Wastes Is Extraordinarily Misguided and Perverse

Among the "[t]reatment standards expressed as specific technologies" (Proposed § 268.42), the proposal would provide that alkaline wastes be subject to "neutralization with acids to [a pH of 6 to 9] and insoluble salts; or recovery," and that acidic wastes be subject to "neutralization to [a pH of 6 to 9] and insoluble salts; or recovery." 54 Fed. Reg. 48515 (top of first column). These essentially-neutral pH levels are a far cry from the corrosive characteristic, defined as liquid waste below 2.0 pH or above 12.5 pH. See 54 Fed. Reg. 48422. EPA's stated reasons for this extreme deviation are sketchy, consisting of concerns that non-neutral wastes might impair clay liners, increase the mobility of hazardous constituents, and diverge from the pH of natural groundwater. *Id.* at 48423. However, this explanation is wholly flawed. Clay liners are not impaired as shown by studies cited and described in the comments of the Chemical Manufacturers Association. Any migration of metals is addressed by the specified extraction procedure for characteristic levels of metals. And many groundwaters naturally have pH values well outside the range proposed by EPA for a treatment standard. For example, one of

Comment Number 3-A-35 (continued)

Docket Number LD12-00196.

Commenter SCM Chemicals, Inc.

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

SCM's plants is in the Baltimore-Anne Arundel County area of Maryland where natural groundwaters exhibit a pH of 3.4 to 6.5 (Patapsco and Patuxent aquifers). See F. H. Chapelle, Maryland Geological Survey Report of Investigations No. 43, Hydrogeology, Digital Solute-Transport Simulation, and Geochemistry of the Lower Cretaceous Aquifer System Near Baltimore, Maryland, pp. 46-47 & Table 6a, 52 (1985).

Moreover, pH is a parameter found in most NPDES permits. There, however, the parameter is by federal rule expressed in terms of a pH range to be achieved 99 percent of the time. 40 C.F.R. § 401.17. This regulation was based upon an extensive study of the performance of existing best-technology treatment systems. Also, there is no constraint on the neutralizing agent in the NPDES regulations.

The NPDES regulations take account of the difficulty of maintaining a pH range of 6 to 9 at the point of discharge, after neutralization, often-extensive equalization, and final polishing or adjustment steps. SCM employs extensive neutralization systems in its industrial operations, which systems are designed to, and do, implement the NPDES requirements. They are not capable of treatment as the Agency would require it in these proposed regulations.

Comment Number 3-A-35 (continued)

Docket Number LD12-00196

Commenter SCM Chemicals, Inc.

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

The waste streams are unbuffered solutions of so-called "strong" mineral acids. Initial neutralization typically but not always achieves results in the 4 to 11 pH range, using complex computer-based feed-forward, feed-back control loops for the neutralization. The neutralization curves are relatively steep and slight changes can make a considerable difference in the immediately resulting pH. Extensive equalization and subsequent adjustment is required to obtain effluents that satisfy the NPDES parameters. None of these considerations are reflected in the Agency's simple recitation that neutralization with lime is readily accomplished. 54 Fed. Reg. 48423.

COMMENT NUMBER: 3-A-35
DOCKET NUMBER: LD12-00196
COMMENTER: SCM Chemicals, Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

As noted by this commenter, the Agency proposed the 6-9 pH requirement for several reasons including the increased mobility of hazardous constituents from clay liners. The Agency still believes that this is a legitimate concern. However, based on information supplied by this commenter and other commenters, the Agency believes that the impact of low pH wastes on clay liners is not significant. Additionally, the Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

~~Comment Number~~

3-A-36

~~Docket Number~~

LD12-00267

~~Comment~~

Allied Signal, Inc.

~~Issue~~

D002: Characteristic Corrosive Wastes

~~Subissue~~

Proposed pH requirement

~~Comment~~

B. The Requirement that Acidic and Corrosive Wastes be Neutralized to the Range of pH 6.0 to 9.0 is Not Supported by the Evidence

1. The pH Range For Surface-Disposed Corrosive Wastes Is Not Supported By the Evidence

The proposed requirement that acidic and alkaline corrosive wastes be neutralized to the pH range of 6.0 to 9.0 is not supported by the evidence. The Agency presents three reasons for the proposed range, but the proffered reasons are not supported by the evidence and, in any event, fall far short of justifying the proposed choice.

First, EPA states that "hydronium ions from acids solubilize metals from clay liners, impacting their ability to act as barriers to migration." 54 *Fed. Reg.* 48423. No support for this statement is cited in either the preamble or in the Background Document. What is most noteworthy about EPA's assertion, however, is that it serves as no justification whatsoever for any limitation on the alkaline pH (as opposed to acidic pH). Moreover, the statement does not contain a rationale for setting the limit on the acid pH as close to neutral as pH 6.0. This is particularly important in light of the fact that rainfall itself is frequently pH 4.5 or below.¹⁹

¹⁹ Stensland, Whelpdale & Oehlert, "Precipitation Chemistry," in *Acid Deposition: Long-Term Trends* 128-99 (1986).

Comment Number 3-A-36 (Continued)

Docket Number LD12-00267

Commenter Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comments

Second, EPA claims that wastewater with a pH between 2.0 and 6.0 "can increase the mobility of many hazardous constituents in groundwater relative to wastes in the pH range of 6 to 9." 54 *Fed. Reg.* 48423. While this might be true, EPA has failed to consider whether allowing the land disposal of wastes at a pH less than 6.0 will have any impact on the pH of the groundwaters, in light of the buffering capacity of the soils and of the groundwater itself.¹⁷

Moreover, EPA has seemingly lumped all pH readings between 2.0 and 6.0 together, while in fact, because the pH scale is logarithmic, the difference between pH 2.0 and pH 6.0 is 4 orders of magnitude. If pH 2.0 is a problem, that does not mean that a pH ten times higher, to pH 3.0, is a problem; and if pH 3.0 is a problem, that also tells us nothing about whether a pH ten times higher than that, to pH 4.0, would be a problem; and so on. Again, however, the most noteworthy aspect of EPA's assertion that pH between 2.0 and 6.0 can cause the mobilization of hazardous constituents in groundwater is that it provides no justification whatsoever for any limitation on the alkaline pH.

¹⁷ In fact, just as the potential impact of a soluble salt must be evaluated in the context of a particular aquatic ecosystem, the impact of a wastewater pH on groundwater and soil must be evaluated in the context of a particular ecosystem's buffering capacity. In areas with high soil buffering capacity, scientists conclude that there would be no negative impact if the pH of rainfall was as low as 4.0 for over a century. Crosby, Hornberger, Galloway & Wright, "Time Scales of Catchment Acidification," 19 *Environ. Sci. Technol.* 1144-49 (Dec. 1985).

....
... Comment Number 3-A-36 (continued)

Docket Number LD12-00267

Commenter Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Commenter

EPA's final justification for the pH 6.0 to 9.0 range is that this range "matches the buffering of natural aquatic systems based on carbonate/bicarbonate pH relationship (i.e., pH 5.5 and 8.5 . . .)." 54 Fed. Reg. 48423. Since natural aquatic systems are fully protected from any adverse impact due to pH by the NPDES permit requirement for discharges into the waters of the United States, under which virtually all discharges are required to be treated to the pH 6.0 to 9.0 (or sometimes to the 6.0 to 8.5) range prior to discharge, this rationale seems irrelevant.

Moreover, the admission that the natural carbonate/bicarbonate pH relationship extends down to the pH range of 5.5 undercuts the proposed treatment standard requiring the pH range to be brought up to pH 6.0.¹⁹ There is a significant difference between pH 5.5 and pH 6.0; pH 6.0 is 3 times closer to neutral than pH 5.5.

¹⁹ Distilled water in equilibrium with atmospheric CO₂ has a pH of 5.6, due to the formation and disassociation of carbonic acid. By setting the acidic end of the required pH range at 6.0, EPA's regulation would require treatment of wastes to a level of corrosiveness less than that of distilled water.

Consent Number 3-A-36 (continued)

Docket Number LD12-00267

Consentee Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

In light of all this, even if EPA has the authority to set treatment standards for pH corrosive wastes at a level other than at the characteristic level, we would suggest that EPA set the treatment range at pH no higher than 4.5 to 12.5. As mentioned earlier, the pH level of rainfall is often in the vicinity of pH 4.5, and we can see no reason for setting a land ban treatment standard at a level that is exceeded by rainfall. Moreover, EPA has not suggested any reason for limiting the alkaline pH of wastes to be disposed of on the land, except perhaps the impact that high pH could have on natural aquatic ecosystems – but such ecosystems are fully protected from the effects of pH by the NPDES water permit system.

Allied's concerns with both the acidic and alkaline pH limits are not academic. With respect to the alkaline limit – that is, the proposed treatment standard requiring the pH level to be no greater than 9.0 – Allied's Metropolis, Illinois Works currently discharges 225,000 gallons per day of strongly alkaline wastewaters into a large basin for final sedimentation prior to neutralization to the pH 6.0 to 9.0 range and discharge through an NPDES permitted outfall. The wastewaters are strongly alkaline as a result of the treatment received at the wastewater treatment plant prior to the "land disposal," where lime is added to the wastewaters in order to precipitate calcium fluoride and to

Comment Number 3-A-36 (continued)

Docket Number LDI2-00267

Commenter Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

precipitate conventional arsenic.¹² The presence of sodium and potassium ions, coupled with the lime treatment, drive the pH of these wastewaters to 13.0 and above. To pretreat these wastewaters so as to bring the pH down below pH 12.5 prior to the land disposal would require the installation of a single stage neutralization unit, but to bring the pH down to pH 9.0 or below would require the installation of a two-stage neutralization unit. To the extent that the wastewaters contain sodium and potassium, the generation of insoluble salts would be impossible because the sodium and potassium salts of any conceivable neutralizing acid are all highly soluble (e.g., sodium sulfate, potassium chloride, sodium nitrate).

The basins currently receiving this alkaline wastewater are RCRA Subpart C facilities. For such basins in particular, it seems absurd to require facilities to go to the expense of installing two-stage neutralization. Moreover, these basins already have a large inventory of previously disposed material, including a large amount of excess lime carried through from the treatment unit and settled out in the basins. Neutralization prior to land disposal will have very little impact on the pH of the basins as a whole.

¹² In addition to conventional arsenic, the wastewaters at this facility also contain hexafluoroarsenate, which cannot be treated by any conventional means. This is discussed at greater length in Section IV.

Comment Number 3-A-36 (continued)

Docket Number LD12-00267

Commenter Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

In addition, we are concerned that neutralization prior to the final sedimentation that occurs in these basins could make it very difficult for Allied to comply with the fluorine limitations contained in the facility's NPDES permit. With neutralization prior to sedimentation, some of the calcium fluoride that currently settles in these basins will redissolve, possibly resulting in excess fluorine.² It is also possible that neutralization prior to final sedimentation could cause more arsenic to be released into the waters.

Further, it is by no means clear that it would be feasible to install a two-stage neutralization process prior to the basins at the Metropolis facility. While the products of neutralization will unavoidably include soluble salts, it is likely that calcium sulfate will be generated as well. Whether it would be feasible to handle the solids that would be generated depends on an engineering assessment of the available space which has not yet been performed.

² To the extent that the high pH levels in the impoundments overcomes the effect of the pre-land disposal neutralization, resulting in the re-precipitation of calcium fluoride, what would the point of such neutralization be? Thus, to the extent such neutralization does harm, it should not be required, and to the extent that it does not do harm, it is pointless and should not be required.

~~Consent Number~~ 3-A-36 (continued)

~~Docket Number~~ LD12-00267

~~Consent~~ Allied Signal, Inc.

~~Issue~~ D002: Characteristic Corrosive Wastes

~~Subissue~~ Proposed pH requirement

~~Consent~~

2. The pH Range For Deep Well Injection Is Not Supported By the Evidence

In the preamble, EPA raises the possibility of allowing the pH limitation contained in deep well injection permits to override the proposed pH 6.0 to 9.0 treatment standard. While we appreciate EPA's suggestion that EPA should defer to the UIC program in regulating pH in deep well injection, the discussion in the *Federal Register* is an inadequate reflection of the fact that the successful operation of a deep well injection system generally requires maintaining the pH below pH 6.0. See 54 *Fed. Reg.* 48423. A pH this low is necessary to prevent plugging of both the well piping and the injection zone itself. Indeed, at an Allied facility injecting into a particularly forgiving injection zone, it is still necessary to occasionally flush the well piping with strongly acidic material, to clean out deposits formed as a result of operating the injection well at pH 5.0.^{21/}

^{21/} Allied believes that the use of unspent acid to flush out deep well piping does not constitute disposal of a waste, so that such a practice would not be subject to the LDR. If this interpretation is incorrect, EPA should modify the proposed treatment standard to permit this practice which is essential to the maintenance of many deep well systems.

~~Comment Number~~ 3-A-36 (continued)

~~Docket Number~~ LD12-00267

~~Commenter~~ Allied Signal, Inc.

~~Issue~~ D001: Characteristic Ignitable Wastes

~~Subissue~~ Proposed pH requirements

~~Comment~~

While the alternative raised by EPA -- allowing the pH range set in the UIC permit to supersede the treatment standard -- is perhaps acceptable, we are concerned with the legality of this approach, and we believe that the proposed inappropriate treatment standard (requiring pH to be between 6.0 and 9.0) would put enormous and inappropriate pressures on the permit writers to set the pH limitations in the UIC permits at too high a level to assure proper performance.

Instead, we urge EPA to set a pH standard of pH 2.0 to pH 12.5 for deep well injection. EPA has given no justification for a pH range other than this for deep well injection.²⁷ Further, this range would give facilities the flexibility to minimize any possible problems with plugging or clogging.

²⁷ If more restrictive pH limitations are required in specific situations in order to fully protect the environment, EPA should defer to the facility's UIC permit under which appropriate limitations can be established.

COMMENT NUMBER: 3-A-36
DOCKET NUMBER: LD12-00267
COMMENTER: Allied Signal Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. The Agency received many comments, such as this one, indicating that the proposed pH requirement would cause major disruptions in the operations of existing wastewater treatment systems and underground injection wells. For example, every surface impoundment or injection well receiving commingled wastes, one of which was D002 corrosive at the point of generation, would be in violation of the treatment standard if the commingled waste stream was outside of the 6-9 pH range. This would effect thousands of units, most of which are Subtitle D units and hence not presently affected by RCRA Subtitle C. Additionally, as noted by this commenter.

Other commenters, including this one, noted that the 6-9 pH requirement would cause problems, such as plugging in underground injection wells. Many injection wells operate at a pH of less than 6 so metals do not precipitate out of solution and cause plugging. A pH that is out of the 6-9 range is often specified in Underground Injection Control (UIC) permits to ensure that injected fluid flows properly through the injection zone without plugging. The Agency believes that pH requirements for injection wells should be decided on a case-by-case basis through UIC permits or based on the operator's knowledge of the injection well.

COMMENT NUMBER: 3-A-36 (continued)
DOCKET NUMBER: LD12-00267
COMMENTER: Allied Signal Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number

3-A-37

Docket Number

LD12-10010

Commenter

Hoechst Celanese

Issue D002: Characteristic Corrosive Wastes

Subissue proposed pH requirement

Comment

III. EPA is proposing that D002 Acidic Subcategory and D002 Alkaline Subcategory be treated to pH 6-9 prior to land disposal. Hoechst Celanese believes treatment to these levels is wasteful, would significantly hinder our ability to deep-well inject certain waste streams and is counterproductive. Incineration should be added to partial neutralization as a BDAT treatment alternative.

A. Requiring that D002 acidic/alkaline waste be treated to pH range 6 to 9 is a waste of resources.

In a typical Hoechst Celanese production facility, D002 acidic and alkaline wastes are generated during the treatment of incoming water for boilers and cooling. In this process, ion exchange resins are regenerated using acid and alkaline treatment. From this regeneration process, waste acid and waste alkaline (D002) is generated.

It is the practice of Hoechst Celanese (and a common industry practice) to neutralize one waste stream with the other. The reacted mixture is then tested and, if necessary, additional acid or base is added to ensure that the mixture no longer exhibits a characteristic hazard. Prior to discharge, the waste stream is reacted to the pH range specified in the facility's NPDES permit or in the acceptability criteria of the receiving POTW.

To require neutralization beyond the level specified by the Clean Water Act or the receiving POTW, requires the introduction, into the mixture, of additional neutralization agent and consequently, the generation of additional salts (e.g. Na₂SO₄). Hoechst Celanese believes that it is unnecessary and, therefore, wasteful to require neutralization of wastewater streams beyond the level required under applicable Clean Water Act provisions.

* It should be noted that this reaction must occur after one of the waste streams has been significantly diluted - otherwise, a violent reaction would occur.

Comment Number 3-A-37 (continued)

Docket Number L012-L0010

Commenter Hoechst Celanese

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

- B. Hoechst Celanese must maintain certain pH ranges for waste streams which are deep well injected.

The Agency notes, on page 48423 of the proposed rule,

"that the pH range 6 to 9 may not be appropriate for deep well injection into certain formations. A different pH range may be specified in permits to ensure that injected fluid flows properly through the injection zone without plugging."

The Agency then solicits comments on whether any pH range specified in an underground injection control permit should supersede the final rule.

Hoechst Celanese's well permits either do not specify a pH range or specify a pH range which is above a certain minimum. For example, the well permit for the Hoechst Celanese, Chemical Group, Inc. Bay City plant acid well set the pH of injected waste streams at not less than 2.0. The reason the well permit allows such acidic waste to be injected is that EPA made a site specific decision that the well formation receives acidic wastes more efficiently than neutral wastes.

As a second example, the Hoechst Celanese (Celanese Engineering Resins, Inc.) Bishop Plant routinely maintains the injected waste stream at a pH of 4.5 to 5.0. The deep well formation at Bishop consists of interspersed clay, quartz, feldspar and about 16-27 percent calcite. This composition is predominant throughout the formation. Acidic fluids enhance the flow through the formation by dissolving some of the calcite and allowing increased formation porosity. A more neutral liquid approaching pH 7.0 would cause the clays to swell thereby reducing the formation's ability to accept the liquids and, eventually eliminate the well's usage. At our remaining deep well facilities, specific pH ranges are maintained to protect the integrity of the injection zone and/or to control the corrosion rate of the carbon steel injection stringer.

The treatment standards are intended to be set at BDAT levels. For corrosive wastes this level has no meaning. It is certainly possible to neutralize all wastes to a pH of 7. EPA recognized that such complete neutralization is unnecessary and instead has arbitrarily set a range at between pH 6-9. Such a narrow range is not necessary to protect worker exposure. It is merely a generalized assumption appropriate for some methods of disposal. As discussed above, however, it is counterproductive for other methods of disposal. The treatment standard should be set at the nonhazardous range of pH 2 - 12.5.

COMMENT NUMBER: 3-A-37
DOCKET NUMBER: LD12-L0010
COMMENTER: Hoechst Celanese
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. The Agency received many comments, such as this one, indicating that the proposed pH requirement would cause major disruptions in the operations of existing wastewater treatment systems and underground injection wells. For example, every surface impoundment or injection well receiving commingled wastes, one of which was D002 corrosive at the point of generation, would be in violation of the treatment standard if the commingled waste stream was outside of the 6-9 pH range. This would effect thousands of units, most of which are Subtitle D units and hence not presently affected by RCRA Subtitle C. The Agency also agrees that the comingling of different process wastes for co-neutralization is a beneficial practice and conserves natural resources.

Several commenters noted that the 6-9 pH requirement would cause problems, such as plugging in underground injection wells. Many injection wells operate at a pH of less than 6 so metals do not precipitate out of solution and cause plugging. A pH that is out of the 6-9 range is often specified in Underground Injection Control (UIC) permits to ensure that injected fluid flows properly through the injection zone without plugging. The Agency believes that the pH requirement for an injection well should be decided on a case-by-case basis through UIC permits or the operator's knowledge of the injection well.

COMMENT NUMBER: 3-A-37 (continued)
DOCKET NUMBER: LD12-L0010
COMMENTER: Hoechst Celanese
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number: 3-A-38

Docket Number: LD12-00194

Commenter: Rohm and Haas

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Proposed pH requirement

Comment:

As such, on-site treatment is the only practical option, and that cannot be accomplished by the effective date of this final rule (May 8, 1990), primarily because of the requirement that neutralization form insoluble salts.

Currently all of the corrosive wastewater at the R and H Houston plant is treated in tanks and other non-land units. The neutralization forms sodium sulfate -- a soluble salt. The pH range of the wastewaters is altered so that they are nonhazardous before they enter our land units, which are impoundments. After various treatment processes in the impoundments, the wastewaters are discharged in accordance with the effluent limitations in our NPDES permit. At Houston, we have spent about \$16 million to construct wastewater treatment tanks and other non-land units to ensure that our land units only receive nonhazardous waste and to comply with the increasingly stringent NPDES requirements.

Comment Number: 3-A-38(continued.)

Docket Number: LD12-00.19.4

Commenter: Rohn and Haas

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Proposed ~~A~~ pH requirement

Comment:

Our wastewater treatment system would have to be substantially overhauled to comply with the proposed treatment standards. R and H would have to: (1) install numerous neutralization tanks and controls to achieve a pH of 6 to 9 and devote substantial manpower to oversee the neutralization operations; (2) change the neutralizing agent from one where we add sodium hydroxide to one where we add lime; (3) install expensive lime handling and solids separation facilities; (4) terminate use of biological treatment of the organics in the wastewater or remove the insoluble salts prior to such biological treatment because the insoluble salt, which would now be formed from using lime, would inhibit biological oxidation; (5) dispose of about 220,000 wet tons per year of the insoluble sludges, much of which would be contaminated with organics and could not be recovered even if there were an adequate market for clean insoluble sludges, which there is not; and (6) restructure our transportation, storage and sludge dewatering systems to handle the large volumes of lime and the massive volumes of insoluble sludges generated by using lime.

Comment Number: 3-A-38 (continued)

Docket Number: LD12-00194..

Commenter: Rohn and Haas

Issue: D002- Characteristic Corrosive Wastes

Subissue: Proposed pH requirement

Comment:

These changes cannot be accomplished by May 8, 1990. The capital costs of these changes at the Houston plant alone would likely be between \$20 and \$40 million. The additional annual operating costs to generate and handle the 220,000 wet tons of sludges and dispose of them off-site (since we do not have the space on-site for such enormous sludge quantities) would conservatively be \$7 million per year (\$2 million for on-site handling of lime and sludges; \$2.5 million for off-site transportation; \$2.5 million for off-site disposal). As will be discussed later in this section, the environmental benefits of these expensive changes are negligible.

Comment Number 3-A-38 (continued)

Docket Number LD12-00194.

Comments Rohn and Haas

Issue D002 - Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

B. Solutions

- (1) EPA should set the treatment standards for corrosive wastewater at the characteristic parameters — pH between 2 and 12.5 and no restriction on formation of soluble salts.

The most direct solution to the corrosive wastewater problem, and the solution which, in our view, is legally mandated, is to require treatment, at most, to the corrosive characteristic parameters. In other words, the treatment standard should be revised to a pH between 2 and 12.5 and there should be no restriction on the formation of soluble salts. By definition, since the wastewater in this range is not a RCRA "hazardous" waste, it does not present a significant hazard even if improperly managed. See RCRA § 3001(a). Moreover, as discussed later in these comments, EPA has no legal authority to require treatment beyond parameters at which the waste is nonhazardous.

....
Comment Number: 3-A-38(continued)

Docket Number: LD12-00194

Commenter: Rohn and Haas

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Proposed pH requirement

Comment:

EPA may counter this jurisdictional argument by saying that Congress intended treatment to the lowest BDAT levels even if that is beyond parameters at which the waste is considered hazardous. But this is clearly not the case with respect to corrosive wastes. Indeed, the legislative history shows that Congress authorized EPA to allow continued in-ground neutralization without any pretreatment. Specifically, the House Report provides:

Where land disposal is allowed, the Committee intends the Administrator to require best management practices that include treatment, not just containment of cleanup. Another example would be the continued use of neutralization basins to render corrosive wastes non-hazardous prior to additional treatment or disposal. [In contrast,] [a]n example of where a pretreatment requirement is appropriate prior to land disposal is the metal finishing industry.

H.R. Rep. No. 198, 98th Cong., 1st Sess., pt. 1, at 38 (1983) (emphasis added). The House Report also provides that "the Administrator might find that a [land disposal] prohibition is not appropriate for all corrosive waste, but only for corrosive waste above a specified pH." Id. at 33.

Comment Number 3-A-38 (continued)

Docket Number LD12-00194.

Commenter Rohn and Haas

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

EPA cannot contend that Congress required treatment standards that are more strict than the corrosive characteristic levels when the legislative history shows that Congress was willing to allow continued in-basin neutralization of corrosive waste. Indeed, the only reference to treatment of corrosive waste in the legislative history is that EPA could require "neutralization of acidic wastes as a condition of land disposal." Id. at 38. This does not say that corrosive wastes must be neutralized, or must be neutralized beyond a 2 to 12.5 pH range and to an insoluble salt form. Such an interpretation would be highly questionable given Congress' position that EPA could continue to allow in-basin neutralization, and given the fact that neutralization of a hazardous corrosive waste is commonly understood in RCRA as achieving a pH of between 2 and 12.5.

Comment Number 3-A-38 (continued)

Docket Number LD12-00194

Commenter Rohn and Haas

Issue 0002 - Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

- (2) EPA should, at least, adopt an interim treatment standard for corrosive wastewaters at the characteristic parameters -- pH between 2 and 12.5 and no restriction on formation of soluble salts.

R and H steadfastly believes that EPA has no legal authority to require treatment of a waste beyond the point at which it becomes nonhazardous. Nonetheless, EPA has requested comment on the practical necessity of interim treatment standards at the characteristic parameters, and on the environmental justification for the proposed standard of pH between 6 and 9 and insoluble salts. We will address these practical and environmental issues below, but we in no way wish to infer that EPA can disregard its lack of legal authority to require treatment of a waste beyond the point at which the waste becomes nonhazardous.

First, EPA requests comment on whether to adopt treatment standards at the characteristic parameters on an interim basis, particularly in light of the implementation problems. 54 Fed. Reg. at 48,491/2. EPA would be disregarding reality if it did not, at least on an interim basis, set the treatment standards at the characteristic parameters (pH between 2 and 12.5 and no restriction on soluble salts). R and H cannot comply by May 8, 1990 with the proposed treatment standard of pH of 6 to 9 and insoluble salts through on-site neutralization. Compliance would necessitate huge changes to our wastewater treatment and sludge management system which we have summarized above.

....
Comment Number 3-A-38 (continued)

Docket Number LD12-00194.

Commenter Rohm and Haas

Issue D002- Characteristic Corrosive Wastes

Subissue proposed pH requirement

Comment

Thus, the only alternative to noncompliance or plant shutdowns is to adopt interim treatment standards at the characteristic parameters of pH between 2 and 12.5 and no restriction on formation of soluble salts. In R and H's case, these interim standards would need to be retained for three to five years until the necessary changes could be made to our wastewater treatment system to meet the proposed standard, assuming money were no object.

Comment Number

3-A-38

(continued)

Docket Number

LD12-00194

Commenter

Rohn and Haas

Issue

D002: Characteristic Corrosive Wastes

Subissue

Proposed Insoluble Salt Requirement

Comments

- (4) In addition to allowing formation of sodium sulfate, EPA should allow very limited excursions from the 6 to 9 pH range, such as are allowed under NPDES permits.

As discussed earlier, EPA has no legal authority to require treatment of a wastewater to a pH range of 6 to 9 when the wastewater has been treated to a nonhazardous pH level of between 2 and 12.5. If EPA, nonetheless, finalizes the treatment standard at pH between 6 and 9, it should allow for limited excursions to the 6 to 9 pH range. The excursions could be limited in the same manner as they are under NPDES permits, where 7 hours and 12 minutes of excursions are allowed per month. See 40 C.F.R. Part 122. This limited flexibility is needed, particularly at facilities with batch operations.

In batch processes, each wastestream has a unique pH and volume level and may contain other constituents that interfere with neutralization. The amount of base or acid that must be added to neutralize the wastestream, the flow rate, and other timing factors will vary for each wastestream. Because of buffering, the pH level may plateau and then spike in unpredictable ways. For all of these reasons, every grab sample of the neutralized wastewater almost certainly will not be between a pH of 6 to 9.

Thus, EPA should adopt a treatment standard and enforcement approach that accounts for the variability and buffering problems. A single grab sample is inappropriate. We believe an NPDES approach is much more realistic and has a history of feasibility.

COMMENT NUMBER: 3-A-38
DOCKET NUMBER: LD12-00194
COMMENTER: Rohm and Haas
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. The Agency received many comments, such as this one, indicating that the proposed pH requirement would cause major disruptions in the operations of existing wastewater treatment systems. For example, every surface impoundment receiving commingled wastes, one of which was D002 corrosive at the point of generation, would be in violation of the treatment standard if the commingled waste stream was outside of the 6-9 pH range. This would effect thousands of units, most of which are Subtitle D units and hence not presently affected by RCRA Subtitle C.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in

COMMENT NUMBER: 3-A-38 (continued)
DOCKET NUMBER: LD12-00194
COMMENTER: Rohm and Haas
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Costs are not a consideration when determining BDAT. Also, the Agency is also not promulgating the proposed insoluble salt requirement. The reason for this are presented in Section 3-B of this response to comments document.

Comment Number: 3-A-39

Docket Number: LD12-00172.

Commenter: HWTC

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Proposed pH requirement

Comment:

C. D002

1. BDAT pH Range

EPA inappropriately proposed the treatment standard for pH for D002 waste streams at pH values between 6.0 and 9.0. Although it is true that these wastes are corrosive material and can be neutralized to reduce corrosivity by addition of acid or base to obtain a final pH of 6.0 to 9.0, some parameters of concern may not be effectively treated within this pH range.

Comment Number: 3-A-39 continued

Docket Number: LD12-00122

Commenter: HWTC

Issue: D002- Characteristic Corrosive Wastes

Subissue: Proposed pH requirement

Comment:

The BDAT treatment standards for D002 wastes in the acid and alkaline subcategory 261.22(a)(1) should be amended to provide for a broader pH range. The BDAT Treatment Standards for D002 Acid and Alkaline wastes should be amended as follows:

BDAT Treatment Standards for D002
Acid Subcategory 261.22(a)(1)

Neutralization with Bases to: $6 < \text{pH} < 11.5$; or
Recovery as a Method of Treatment

BDAT Treatment Standards for D002
Alkaline Subcategory 261.22(a)(1)

Neutralization with Acids to: $6 < \text{pH} < 11.5$; or
Recovery as a Method of Treatment

In many cases, corrosive liquids are contaminated with heavy metals and/or analogous (like cyanide) which require removal or destruction before the wastewaters can be discharged to POTW's or other outfalls. The non- wastewater residues from treatment of these waste streams will reflect the pH characteristics of the treatment conditions used to precipitate and remove or destroy these contaminating species.

...
Comment Number 3-A-39 continued
Docket Number LD12-00172
Commenter HWTC
Issue D002 - Characteristic Corrosive Wastes
Subissue Proposed pH requirement
Comment

In many cases, pH values as high as 10 to 11.5 units have to be maintained during treatment to effectively reduce such contaminating parameters as complexed copper, nickel, zinc and other heavy metals as well as phosphates and certain other anions. Metal solubility issues with pH and metals such as nickel, chromium and lead have minimal solubilities at pH values above 9.0 (see Development document for effluent limitations for electroplating point source category, EPA Effluent Guideline Divisions, August, 1973).

Limiting the non-wastewater residue from these treatment processes would severely limit the effectiveness of the removal of these contaminating parameters. Therefore, we recommend setting pH standards for D002 corrosive waste streams at 6.0 to 11.5 units in order to allow proper treatment and removal of contaminating toxic parameters.

Comment Number 3-A-39 continued

Docket Number LD12-00172.

Commenter HWTC

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Proposed pH requirement

Comment:

EPA's proposed treatment standard of $6 < \text{pH} < 9$ will preclude the optimum treatment of metal-bearing corrosive wastes because the treatment standard's upper limit does not permit optimum stabilization of such wastes. In providing the greatest environmental and human health benefit for metal-bearing corrosive wastes, the waste treater must accomplish three objectives: 1) increase the pH of the waste stream, 2) precipitate the stream's solubilized metals, and 3) stabilize the resulting solids to prevent re-dissolution or leaching of metals in the future. Therefore, the solids resulting from the treatment of corrosive liquids (particularly, metal-bearing acids) must sometimes be stabilized at a pH approaching 12.5 to truly minimize the potential of metals leaching and migration.

...
Comment Number 3-A-39 (continued)

Docket Number LD12-00172

Commenter HWTC

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed pH Requirements

Comment

We believe that EPA has already recognized and endorsed the need to stabilize metal-bearing wastes in a final matrix which has a pH well above the proposed limit of pH 9. Most notably in its promulgation of the treatment standard for F006 non-wastewaters (and a variety of other metal-bearing listed wastes), the Agency established part of the treatment standard on stabilization with cement kiln dust - a process which can yield a product with a pH above 12.5. It is crucial to realize that the neutralization of corrosive wastes results in the co-generation of both wastewater (the effluent) and non-wastewater (the precipitate); therefore, the F006 treatment standard is germane to this issue. A variety of F006 waste streams also exhibit the characteristic of corrosivity. Because F006 streams are listed, in part, on the basis of their metals content, and given that metals must typically be stabilized in processing conditions well above pH 9.0, the Agency's proposed standard directly conflicts both with previously promulgated standards and with the objective of reducing the mobility of toxic constituents, particularly for acid and alkaline metal-bearing corrosive wastes.

... Comment Number 3-A-39 (continued)
Docket Number LD12-00172.
Commenter HWTC
Issue D002 - Characteristic Corrosive Wastes
Subissue Proposed pH requirement
Comment

Higher pH limits are also supported by the Agency's report to Congress dated February 7, 1986, wherein EPA summarizes the effects of the domestic sewage exclusion. [The Study was statutorily mandated per HSWA section 3018(b).] As an outcome of both the Study and a subsequent ANPR published at 51 FR 30166, EPA concluded two points: 1) virtually all pH related incidents at POTW's involved acidic wastes and 2) the Agency has no evidence to conclude that high pH wastes are a problem for most POTW collection systems. Clearly, higher pH limits should be allowed for the acid and alkaline wastes for subcategory 261.22(a)(1).

Part of the Agency's rationale for the standard causes some confusion inasmuch as it references the effect of liquid waste on clay liners:

"The Agency is proposing a range of pH 6 to 9 instead of the characteristic range of pH 2-12.5 for several reasons. First, hydronium ions from acids solubilize metals from clay liners, impacting their ability to act as barriers to migration. Moreover, acid wastes between pH 2 and 6 can increase the mobility of many hazardous constituents in groundwater relative to wastes in the pH range of 6 to 9." [54 Fed. Reg. 48423]

In its rationale the Agency rightfully refers both to metals solubilization and the adverse effects on clay liners as a function of acidic wastes.

Comment Number 3-A-39 (continued)

Docket Number LD12-0017.2

Commenter HWTC

Issue D002 - Characteristic Corrosive Wastes

Subissue Proposed pH requirements

Comment

We agree that this is a crucial consideration, and we re-emphasize that metals solubilization is largely a factor of acidic pH. Also, it is important to note that metals solubilization is a function of alkaline pH to the extent that metals tend to leach and re-solubilize at pH's in the weak to moderate alkaline range. It is typically in the range of 10-11.5 that metals stabilization is optimized. At such a pH level, the process residual retains sufficient alkalinity to prevent metals leaching. Again, we emphasize that, while the proposed standard is aimed at "aqueous" corrosive wastes, solids result from the neutralization process; the standard must necessarily consider the pH issue with respect to the waste in its treated form and resultant precipitate.

The 11.5 upper alkaline pH limit must not be applied to the non-wastewater stabilized residual, and should only be applicable to the wastewater consistent with the corrosive waste definition limited to aqueous or liquid waste under 261.22(a)(1) and (2). If the Agency's intention is to set a non-wastewater pH standard, this should be set at a level of 12.5, since many stabilization agents such as cement, lime and kiln dust have pH levels in this range.

COMMENT NUMBER: 3-A-39
DOCKET NUMBER: LD12-00172
COMMENTER: HWTC
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

Many commenters, such as this one, noted that the proposed 6-9 pH requirement would prohibit the optimum removal of metals in a waste stream. Waste characterization data shows that many D002 wastes also have metal constituents. A pH of about 10 is optimum for removal of many metals and subsequent stabilization. By proposing a 6-9 pH requirement, the Agency did not intent to interfere with pH requirements for other necessary components of treatment trains. Therefore, the Agency agrees with the points made by this commenter for raising the upper pH requirement to above 9.

The Agency also agrees with the points made by this commenter that acid wastes may adversely affect clay liners. However, based on information supplied by other commenters, the Agency believes the impact of low pH wastes on clay liners is not significant.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by

COMMENT NUMBER: 3-A-39 (continued)
DOCKET NUMBER: LD12-00172
COMMENTER: HWTC
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

~~Comment Number~~

3-A-40

~~Docket Number~~

LD12- L0005

~~Comment~~

KODAK

~~Issue~~

D002: Characteristic Corrosive Wastes

~~Subissue~~

Proposed pH Requirement

~~Comment~~

Attainment of pH Levels Between 6 and 9 Are Unnecessary Before
Introduction of Corrosive Wastes into Land Based Wastewater Treatment
Systems.

This paragraph refers to that portion of the EPA proposal which would require EDAT treatment standards for the D002 Acid Subcategory as neutralization with bases to pH between 6 and 9 and for the Alkaline Subcategory as neutralization with acids to the same limits. The point of measurement is for the land disposal program would be prior to land disposal. This requirement is unnecessarily restrictive for land-based wastewater treatment systems and ignores the buffering ability of the volume of liquids in the impoundment. This requirement unnecessarily demands an excessive use of acids or alkalis to accomplish the buffering benefits naturally available in the impoundment.

We suggest that the EDAT treatment standards for this situation require only that the pH within the first impoundment be maintained between 6 and 9, the optimum range for most biological activity, and that the influent pH be maintained between 2 and 12.5. This will allow and encourage the aggregation of waste streams which may partially neutralize each other and therefore require that less fresh materials be introduced into the overall waste stream. This is particularly true when waste streams in both the alkaline and acid subcategories are present. Even natural alkalinity of many waters will partially neutralize acids so that some waste streams will partially neutralize acid streams even though they are not corrosive as originally characterized.

Allowance Should Be Made For Situations Where a pH of 6 to 9 Is Not
the Optimal Target.

Since natural waters are frequently outside the range of pH between 6 and 9, and a buffering situation may increase the amount of neutralization needed to reach that goal, site specific situations may indicate that a wider range of pH standards would be more appropriate, especially where background levels vary from this range. Blind adherence to the standard of pH between 6 and 9 may not always be appropriate and alternative pH ranges should be considered.

COMMENT NUMBER: 3-A-40
DOCKET NUMBER: LD12-L0005
COMMENTER: Kodak
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

The Agency acknowledges and agrees with the points made by this commenter. The Agency received many comments indicating that the proposed 6-9 pH requirement would cause major disruptions in the operations of existing wastewater treatment systems, such as indicated by this commenter. For example, every surface impoundment or injection well receiving commingled wastes, one of which was D002 corrosive at the point of generation, would be in violation of the treatment standard if the commingled waste stream was outside of the 6-9 pH range. This would effect thousands of units, most of which are Subtitle D units and hence not presently affected by RCRA Subtitle C. Additionally, commenters noted that wastewater facility discharges are currently being regulated by NPDES and POTW permits.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and

COMMENT NUMBER: 3-A-40 (continued)
DOCKET NUMBER: LD12-L0005
COMMENTER: Kodak
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3-A-41

Docket Number LD12 - L0007.

Commenter CMA

Issue: D002: Characteristic Corrosive Wastes

Subissue: Proposed pH requirement

Comment

I. The Proposed Treatment Standards for D002 Acid and Alkaline Wastes Are Environmentally Unnecessary and Technically Infeasible.

EPA has proposed treatment standards for D002 acid and alkaline wastes that require neutralization to a pH of 6 to 9 using agents that form insoluble salts. 54 Fed. Reg. at 48,422. The Agency's rationale for these proposed standards include: (1) hydronium ions may solubilize metals from clay liners; (2) hazardous constituents in ground waters may be mobilized by pH values below 6 or above 9; (3) this pH range matches the buffering capacity of natural systems; (4) and soluble salts, if improperly managed, could adversely impact fresh water systems. As will be discussed in the following subsection and again in Section XVI with respect to injected wastes, EPA has not conducted a thorough technical analysis of its assumptions, and its proposed standards for D002 alkaline and acid wastes are not only technically infeasible for some wastes, but also may cause adverse environmental impacts.

...
Comment Number 3-A-41 (continued)

Docket Number LD12-L0007.

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

1. EPA's Concern That Wastes Will Solubilize Metals From Clay Liners Is Ill-Founded.

With respect to acidic wastes solubilizing metals from clay liners, a 1986 study (Finno, R.J., and Schuber, W.R., "Clay Liner Capability in Waste Disposal Practice," Journal of Environmental Engineering, 112, 6, American Society of Civil Engineers, pp. 1070-1084, December, 1986) demonstrated that a clay-lined surface impoundment used to store acidic wastewaters containing high metals concentrations (greater than the California-list cut-off levels) was highly resistant to any significant migration of metals during its eight-year operating life. Exposure to the acidic wastes did not appreciably alter the permeability and structural characteristics of the clay liner. EP extraction of the upper 15 centimeters (cm) of the clay liner showed metal concentrations in the extract that were all well below the EP toxicity characteristic levels, although slightly higher than the corresponding levels in the natural clay. At the 45 cm depth, the metals concentrations in the EP extract were identical to background levels, showing that in eight years of impoundment use the leachable metals had not penetrated to a depth 45 cm below the pond bottom.

~~Comment Number~~ 3-A-41 (continued)

~~Docket Number~~ LD12- L0007

~~Comment~~ CMA

~~Issue~~ D002: Characteristic Corrosive Wastes

~~Subissue~~ Proposed pH requirement

~~Comment~~

This study suggests that acidic, metals-containing wastewaters and solids do not significantly degrade the clay's pore structure and increase liner permeability. These results support EPA's decision to codify the statutory level of pH 2 in the California-list land disposal restrictions rule. EPA evaluated the effect of acidic wastes on landfill liners when it promulgated the California-list rules, and concluded that wastes with pH values above the characteristic level of 2 did not cause excessive increases in permeability or metals migration; the current proposal provides no data or analyses to suggest that a pH range of 6-9 is required to protect the environment from metals migration.

-2 EPA's Proposed pH Range Is Unmerited.

-EPA's proposed pH 6-9 range for corrosive hazardous wastes ignores the fact that naturally-occurring soils and ground waters have pH values outside this range. For example, the Agency's Monte Carlo ground water model that has been used to develop the proposed revisions to the Toxicity Characteristic (Background Document for EPA's Composite Landfill Model (EPACML), Public Docket Reference No. TC3N-S0001, July 1988) includes measured groundwater pH values representing the nationwide range of pH that can be expected in groundwaters. The mean pH value is 6.2 and the standard deviation is 1.28 (based on a normal distribution). Based on EPA's data, 43.8 percent of the naturally-occurring groundwater will have a pH of less than 6.

Comment Number 3-A-41 (continued)

Docket Number LD12-L0007.

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

EPA's concern regarding protection of aquatic ecosystems is simply irrelevant to this issue since wastewaters that are discharged to the aquatic environment are not subject to land-ban proscriptions. Moreover, the Clean Water Act (CWA) requires that all waste discharges be permitted, and permits always include pH as a parameter, usually with limits in the range from pH 6-9.

EPA's proposed pH range of 6-9 could also be environmentally counter-productive. For example, one CMA member company operates a non-hazardous biological treatment plant for wastewater that may have been hazardous due to corrosivity prior to aggregation. The wastewater is treated to a pH greater than 2 and less than 12.5 in the pipeline to the treatment system, with the actual influent pH being adjusted based on the needs of the treatment lagoons. The pH range is from 8.5 to 10.5.

Comment Number 3-A-41 (continued)

Docket Number LD12 - L0007.

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

During the biodegradation process, degradation of organic compounds yields carbon which exits the process as carbon dioxide. The carbon dioxide readily forms carbonic acid, reducing the overall lagoon pH to an optimum 7.5. This naturally occurring process optimizes biological activity without the need for direct neutralization.

- Directing facilities to manage corrosive wastes, -
destined for and amenable to biological treatment, in accordance with a 6-9 pH standard will require an owner/operator to continually test the biomass and add additional reagents, rather than rely on the natural buffering effect of the existing management strategy and systems. The facility will incur significant capital costs to redesign the treatment systems and additional operating costs for buffering agents (among other additional operating costs), while possibly reducing the overall effectiveness of the desired biological treatment.

Comment Number 3-A-41 (continued)

Docket Number LD12- LD00.07

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH Requirement

Comment

Neutralizing to the characteristic lure will allow wastes of pH 2-6 and 9-12.5 to be injected into non-hazardous deepwells. Though not requiring a no migration demonstration, Class I nonhazardous wells must, nevertheless, be permitted under EPA's UIC regulation. These regulations are designed -- and in the Agency's own assessment (53 FR 28131) operate effectively -- to protect human health and the environment, specifying underground sources of drinking water.

....
Comment Number: 3-A-41 (continued)

Docket Number: LD12-L0007.

Comment: CMA

Issue: D002: Characteristic Corrosive Wastes

Subissue: Proposed pH Requirement

Comment:

3. Requiring a pH of 6-9 for Deepwell Injected Wastes Will Create Operating Problems For Some Well Systems.

The pH of an injection stream is based not only on consideration of the waste itself, but also the geology of the specific injection site. Setting an arbitrary pH range for injected waste will create operability problems for some well systems. The pH of an injected stream influences the formation in the injection zone of precipitates that affects the operability of the well system. Geochemical interactions may lead to severe reduction in formation permeability or a loss of structural integrity within the formation itself. EPA, Report to Congress on the Injection of Hazardous Waste at III-13 (May 1985). One common problem is the swelling of some clays from contact with the injection fluid. Affected clays can significantly reduce the permeability of the formation. In other instances, polar-organic compounds can be absorbed by some minerals, particularly silicates, and can significantly reduce the permeability of the formation. Other problems that could result include formation of suspended solids, precipitation and polymerization of the waste fluid, and alteration of the injection or confining formation matrix. Such problems frequently can be minimized by operating at pH levels below 4. Waste and formation compatibility problems are specific to the particular formation and waste involved, and the prediction of their compatibility requires site-specific analysis. Therefore, the treatment standard must be flexible to assure the resulting treated wastewater is suitable for injection.

Comment Number: 3-A-41 (continued)

Docket Number: LDI2- L0007.

Commenter: CMA

Issue: D002: Characteristic Corrosive Wastes

Subissue: Proposed pH requirement

Comment:

Since the injected waste must be compatible with the injection zone and injection well construction materials irrespective of the waste category, it is not necessary for BDAT to specify a pH range to protect the environment in the context of deepwell injection. The injection of hazardous waste is regulated by the Office of Drinking Water. As part of the UIC permit process, Class I well operators are required to submit a plan which first identifies anticipated reaction products and then demonstrates that neither the waste itself nor the reaction products will adversely affect the injection and confining zones (53 FR 28140). The operators must also provide assurance that the materials in the well are compatible with the injected fluid. Corrosion monitoring, generally accomplished by exposing well components or coupons to the waste stream can provide the necessary data for assessing well material compatibility. Since there is a well-defined mechanism to assure that injected wastes are compatible with the well materials and the injection zone, it is clearly unnecessary to establish a universally applicable pH range for treated D002 wastes destined for deepwell injection.

COMMENT NUMBER: 3-A-41
DOCKET NUMBER: LD12-L0007
COMMENTER: CMA
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

As noted by this commenter, the Agency proposed the 6-9 pH requirement for several reasons including the solubilization of metals from clay liners. The Agency still believes that this is a legitimate concern. However, based on information supplied by this commenter and other commenters, the Agency believes the impact of low pH wastes on clay liners is not significant. Additionally, the Agency believes that groundwater monitoring and leachate collection requirements are sufficient to control this potential problem. The Agency acknowledges that some naturally occurring groundwater will have a pH outside the 6-9 range.

The Agency received many comments, such as this one, indicating that the proposed 6-9 pH requirement would cause major disruptions in the operations of existing wastewater treatment systems and underground injection wells. For example, every surface impoundment or injection well receiving commingled wastes, one of which was D002 corrosive at the point of generation, would be in violation of the treatment standard if the commingled waste stream was outside of the 6-9 pH range. This would effect thousands of units, most of which are Subtitle D units and hence not presently affected by RCRA Subtitle C. By proposing the 6-9 pH requirements, the Agency did not intend to interfere with pH requirements for other necessary components of a treatment train such as the biological treatment described by this commenter.

Several commenters also noted that the proposed 6-9 pH requirement would cause problems, such as plugging in underground injection wells.

COMMENT NUMBER: 3-A-41 (continued)
DOCKET NUMBER: LD12-L0007
COMMENTS: CMA
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

Many injection wells operate at a pH of less than 6 so metals do not precipitate out of solution and cause plugging. A pH that is out of the 6-9 range is often specified in Underground Injection Control (UIC) permits to ensure that injected fluid flows properly through the injection zone without plugging. The Agency believes that pH requirements for injection wells should be decided on a case-by-case basis through UIC permits or the operators knowledge of the injection well.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number 3-A-42

Docket Number LD12-L0034

Commenter HWTC

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

C. Data Comments Pertaining To D002 Waste

1. pH Range

We concur with data presented by several commenters that EPA should establish BDAT for characteristic wastes at pH 6.0 to 11.5 in order to allow for the most favorable pH treatment conditions to be used for removal of all metals and inorganics which must be treated in the wastewater. We disagree with comments provided by Olin, Monsanto, and Rohm and Haas that it is appropriate to simply discharge without treatment acidic wastes into injection wells or surface impoundments. Acidic wastewater can dissolve toxic metals and mobilize these into groundwater and drinking water resources.

On the basis of our experience and our review of the data submitted to the Agency (in response to the Third Third proposed rule) we continue to advocate that EPA's proposed treatment standard for D002 wastes be amended as follows:

BDAT Treatment Standards For D002
Acid Subcategory 261.22(a)(1)

Neutralization To $6 < \text{pH} < 11.5$; or
Recovery As A Method Of Treatment

BDAT Treatment Standards For D002
Alkaline Subcategory 261.22(a)(1)

Neutralization To: $6 < \text{pH} < 11.5$; or
Recovery As A Method Of Treatment

Comment Number 3-A-42 (continued)

Docket Number LD12-10034

Commenter HWTC

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

The docket is ripe with information that substantiates that many acid streams contain solubilized metals and that such waste streams can be properly neutralized only when the pH of the treated waste is in the range of 10 to 11.5 units. By "properly neutralized" it is meant that the acid stream's pH is made alkaline and the stream's metals are precipitated.

Failing to achieve a pH of 10 - 11.5 will typically cause an unacceptably high level of metals to be dissolved in the effluent, thereby posing adverse impacts to human health and the environment. Both in its development document for electroplating point source effluent limitations and in its promulgation of the treatment standards for a variety of metal-bearing restricted wastes, we believe that EPA has already recognized and endorsed the need to stabilize metal-bearing wastes in a final matrix which has a pH well above the proposed limit of pH 9. Furthermore, as the Agency noted in its February 7, 1986 report to Congress, there is no evidence to conclude that high pH wastes are a problem for most POTW collection systems.

Furthermore, the efficacy of elevated pH's beyond pH 9, as in the stabilization of metal-bearing sludges - is acknowledged by the Agency. We recognize, however, that the Agency's proposed standard in the Third Third draft rule, as well as our proposed amendment to the draft, apply only to aqueous or liquid wastes - not to those wastes that pass the Paint Filter Test (Method 9095).

COMMENT NUMBER: 3-A-42
DOCKET NUMBER: LD12-L0034
COMMENTER: HWTC
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

Many commenters, such as this one, noted that the proposed 6-9 pH requirement would prohibit the optimum removal of metals in a waste stream. Waste characterization data shows that many D002 wastes also have metal constituents. A pH of about 10 is optimum for removal of many metals and subsequent stabilization. By proposing a 6-9 pH requirement, the Agency did not intent to interfere with pH requirements for other necessary components of treatment trains. Therefore, the Agency agrees with the points made by this commenter for raising the upper pH requirement to above 9.

The Agency also agrees with the points made by the commenter that acid wastes can dissolve toxic metals. However, based on information supplied by other commenters, the Agency believes the impact of low pH wastes on groundwater and drinking water resources is not significant.

The Agency believes that existing regulatory requirements such as NPDES and POTW permits, groundwater monitoring, and leachate collection are sufficient to control the factors which caused the Agency to initially propose the 6-9 pH requirement. Based on this and other information received from commenters, the Agency believes that there is no need to regulate D002 acid and alkaline wastes beyond the characteristic levels as part of the land disposal restrictions. Instead, the Agency is promulgating a treatment standard of "Deactivation (DEACT) to Remove the Characteristic of Corrosivity" for all D002 wastes. Because of the diversity of treatment technologies reported by commenters as applicable

COMMENT NUMBER: 3-A-42 (continued)
DOCKET NUMBER: LD12-L0034
COMMENTER: HWTC
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed pH requirement
RESPONSE

to D002 wastes, the Agency believes that a standard of deactivation is best. This standard gives generators and treaters the flexibility to select the technology best suited to treat a particular waste stream. A list of applicable technologies that, when used alone or in combination can achieve this standard, is included in 40 CFR 268 Appendix VI. Also, see 40 CFR 268.42, Table 1 for a detailed description of all technologies referred to by a five letter technology code.

Comment Number: 3-B-1
Docket Number: LD12-00110
Commenter: Thermal KEM/Cyano KEM
Issue: D002- Characteristic Corrosive Wastes
Subissue: Proposed Insoluble Salt Requirement
Comment:

We also object to the specification of neutralization to an insoluble salt. This requirement would preclude the use of many widely used common neutralization agents such as sodium hydroxide, and certain types of lime such as dolomitic lime.

If EPA is concerned with the dissolved solids content of effluent discharges, these are already regulated by POTW's or in NPDES permits under the Clean Water Act. Limits are set in operating permits that control the dissolved solids content of wastewater discharges. A total ban on soluble neutralization agents/salts is therefore unnecessary for protection of the environment, and will disrupt current treatment processes thereby affecting negatively available capacity.

It is necessary to recognize also that the neutralization of nitric acid and hydrochloric acid generates salts which are soluble irrespective of the treatment agent used.

The inclusion of "and Insoluble Salts" poses a significant enforcement issue for both the Agency and the regulated community, as it would impact on the waste analysis requirements of treatment and disposal facilities which are operating per interim and final

authorization. Furthermore, in stating the "preference" for neutralization of acid and alkaline wastes [subcategory 261.22(a)(1)] with calcium hydroxide, the Agency opens to interpretation the issue of proper treatment as required by the standard. By deleting "and Insoluble Salts" from the treatment standard the Agency will not only eliminate interpretive issues that are subject to enforcement actions, but it will also enable generators and treaters to operate without interruption in accordance with their Clean Water permits.

COMMENT NUMBER: 3-B-1
DOCKET NUMBER: LD12-00110
COMMENTER: ThermalKEM/CyanoKEM
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency agrees with the points made by the commenter. The Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some common D002 wastes such as nitric acid and hydrochloric acid as noted by this commenter. Additionally, due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined. Therefore, this definition would be open to interpretation and likely cause confusion. Commenter's also pointed out that effluent discharges are currently requested by either NPDES or POTW permits.

The Agency agrees with these comments; and therefore, has reconsidered the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 wastes.

EPA agrees with the comments described above; and therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits are sufficient to control releases of soluble compounds into the environment from the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

COMMENT NUMBER: 3-B-2
DOCKET NUMBER: LD12-00098
COMMENTER: BP America Inc
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
COMMENT:

Requiring the formation of insoluble salts for the D002 Acid and Alkaline subcategory could render the waste stream less suitable for deep well injection. Removing salts prior to injection will decrease the density of the waste stream. A significant decrease in density can affect the longterm drift and the likelihood of waste movement up an abandoned borehole. When the pretreatment substantially increases the volume to be injected this requirement decreases the life of the injection well. Also, if the higher volumes are generated due to the treatment requirement and are injected this increased volume will cause the waste plume to expand proportionately.

A. The requirement to form insoluble salts is environmentally unnecessary and technically inappropriate.

The proposed D002 Acid and Alkaline treatment standard requires the formation of insoluble salts. Insoluble salt sludges are difficult to dewater and typically have a mass that is three times that of the salt produced (due to water in the sludge cake). Brine solutions are difficult to solidify and are assumed to require a 100 percent addition (by weight) of the solidifying agent, or a doubling in weight of the waste for disposal (Evaluation of Underground Injection of Industrial Waste in Illinois, 1989/1100). CMA's comments also explain that to form insoluble salts sometimes relatively more toxic salts must be formed by using silver and barium compounds. If treatment prior to mixing is required, organic and inorganic constituents, that are frequently part of the D002 waste matrix, may be precipitated along with the neutralization sludge rather than being treated in the biological or carbon adsorption units downstream of the neutralization unit.

Solidification and fixation of these neutralization sludges does not prevent leachate formation but reduces the rate at which hazardous substances leach out of the landfill. The longterm impact of landfill disposal of solidified salts needs to be compared to the subsurface disposal of brines into highly saline aquifers and the disposal of soluble salts already regulated by the NPDES permitting program. There are standards for dissolved salts in fresh waters, and the permit writers must assure that these are satisfied and that aquatic systems are protected before a permit is issued. "In most cases, a comparison of the tightness (lack of permeability) and thickness of confining materials, the existence of conditions that can cause changes in the characteristics of confining materials, and the magnitude of hydraulic head gradients between the disposed wastes and the nearest USDW shows that conditions are generally less favorable for safe disposal in the near surface landfill environment than in the environment of a deep disposal zone." (Evaluation of Underground Injection of Industrial Waste in Illinois, 1989, Illinois Scientific Surveys Joint Report 2).

COMMENT NUMBER: 3-B-2
DOCKET NUMBER: LD12-00098
COMMENTER: BP America, Inc.
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received several comments, including this one, indicating that the proposed insoluble salt requirement would prevent optimum operations at underground injection wells. For example, as noted by this commenter, the formation of insoluble salt would on occasion prevent optimum treatment of certain waste streams such as D002 wastes that also contain organics. By proposing the insoluble salt requirement, the Agency did not intend to interfere with other possible constituents in D002 wastestreams.

For certain waste streams, relatively toxic salts such as silver and barium salts would have to be formed in order to comply with the insoluble salt requirement. Also, many commenters noted that wastewater discharges are already being regulated through NPDES and POTW permits, and D002 wastes that are underground injected are not discharged at all.

Based on information received from commenters, the Agency has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment from the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. The Agency has established this standard to allow the regulated community the flexibility to use the best technology for each specific D002 wastestream. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number:

3-B-3

Docket Number:

LD12-00116

Commenter:

Monsanto

Issue:

D002-Characteristic Corrosive Wastes

Subissue:

Proposed Insoluble Salt Requirement

Comment:

The requirement for "insoluble salts" should not be imposed.

5. There are many, many examples in Monsanto of aqueous streams that are D002 Corrosive (pH) at point of generation that are neutralized in tanks, sumps and sewers. These operations almost universally will not meet the Agency's proposal for "insoluble salts" and also will be jeopardized unless EPA clearly acts to allow self-neutralization by aggregation of acidic and basic aqueous waste streams.

COMMENT NUMBER: 3-B-3
DOCKET NUMBER: LD12-00116
COMMENTER: Monsanto
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency agrees with the commenter that the insoluble salt requirement could negate using alkaline and acidic wastes streams generated onsite to co-neutralize each other. The Agency believes that co-neutralization such as in-line neutralization is a sensible and beneficial management practice and therefore should not be restricted by an insoluble salt requirement. The Agency also believes that existing regulations such as NPDES and POTW permits are sufficient to control discharges of soluble salts into freshwater ecosystems.

Based on information received from commenters, the Agency has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. The Agency has established this standard to allow the regulated community the flexibility to use the best technology for each specific D002 wastestream. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number:

Docket Number:

Commenter:

Issue:

Subissue:

Comment:

3-B-4

LD12-00128

Vulcan Materials Company

D002-Characteristic Corrosive Wastes

Proposed Insoluble Salt Requirement

The Agency has chosen to incorporate into the treatment standard the requirement that the neutralization process should yield insoluble salts as the by-products of the neutralization reaction as opposed to a high dissolved solid content. The discharge of insoluble salts into a fresh water ecosystem is believed by EPA to be less harmful than the discharge of soluble solids. However, the practice of discharging insoluble solids into a fresh water ecosystem is often discouraged by the issuers of NPDES permits and a total suspended solids limitation may be imposed in the discharge permit. The presence of suspended solids can present problems in the operation of deep well injection systems because the suspended solids can plug the pores and other openings in the formation and can result in the well not accepting any liquids at all.

COMMENT NUMBER: 3-B-4
DOCKET NUMBER: LD12-00128
COMMENTER: Vulcan Materials Company
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

When the Agency proposed the insoluble salt requirement, they did not intend for large volumes of insoluble salts to be discharged. The Agency believes that these salts would be dewatered and landfilled. However, the Agency did receive many comments which stated that the insoluble salt requirement was unnecessary because discharges of soluble salts are already regulated by NPDES and POTW permits.

The Agency acknowledges and agrees with this point. EPA also agrees with the point made by this and other commenters that insoluble salts can adversely impact the operation of injection wells.

EPA agrees with the comments described above; and therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits are sufficient to control releases of soluble compounds into the environment from the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

COMMENT NUMBER: 3-B-5
DOCKET NUMBER: LD12-00141
COMMENTER: WASHINGTON STATE UNIVERSITY
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
COMMENT:

3. Page 48424 BDAT Treatment Standards for D002*Acid and Alkaline subcategories

Please consider that there are acid and base neutralizations can never yield 100 % insoluble salts. Although the goal to achieve an insoluble salt to protect water quality is worthy, can soluble aqueous salt solutions resulting from acid and base neutralizations be evaporated, and the resulting solid salt landfilled ?

COMMENT NUMBER: 3-B-5
DOCKET NUMBER: LD12-00141
COMMENTER: Washington State University
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some common D002 wastes such as nitric acid and hydrochloric acid. Additionally, due to the various degrees of solubility of salts, the Agency believes that the term "insoluble cannot be positively defined. Therefore, this definition would be open to interpretation and likely cause confusion.

The Agency believes that individual facility discharge permits (NPDES or POTW) are sufficient to control the release of soluble salts into the environment from the treatment of D002 acidic and alkaline wastes.

EPA agrees with the comments described above; and therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits are sufficient to control releases of soluble compounds into the environment from the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

COMMENT NUMBER: 3-B-6
DOCKET NUMBER: LD12-00095
COMMENTS: American Paper Institute
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement

COMMENT: C. Neutralization of Nitric Acid and Sodium or Potassium Hydroxide Solutions to Insoluble Salts is Not Possible and Cannot, Therefore, be Considered Best Demonstrated Available Technology for These Waste Streams

Some industrial waste streams contain nitric acid, sodium hydroxide, or potassium hydroxide. As NCASI illustrates in its comments, it is not technically feasible to neutralize nitric acid, sodium hydroxide, or potassium hydroxide, to insoluble salts. Accordingly, precipitation of these materials to insoluble salts is neither "demonstrated" nor "available" technology as the Agency has defined these terms. 54 Fed. Reg. 48380/3.

EPA considers a treatment technology to be "demonstrated" if it has data "primarily based on . . . full-scale treatment operations that are currently being used to treat the waste (or a similar waste)." Id. EPA considers demonstrated technology to be "available" if "the technology itself or the services of the technology [may be] purchased." Id. Neither criterion is met by EPA's proposed requirement that insoluble salts result from neutralization of nitric acid, sodium hydroxide, or potassium hydroxide. Accordingly, EPA should revise BDAT for corrosive wastes containing these materials to allow neutralization to soluble salts.

COMMENT NUMBER: 3-B-6 Continued
DOCKET NUMBER: LD12-00095
COMMENTER: American Paper Institute
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
COMMENT:

- D. Application of EPA's BDAT Requirement of Neutralization To Insoluble Salts to Corrosive Wastes Containing Hydrochloric and Other Acid Halides Would Create Large Quantities of Sludges Containing Heavy Metals and Does Not, Therefore, Comport With Section 3004(m).
-

As discussed in detail in NCASI's comments, application of EPA's BDAT requirement of neutralization to insoluble salts to hydrochloric acids and other acid halides (except hydrogen fluoride) will result in generation of large quantities of heavy metal sludges, because all of the substances that could form insoluble salts from these acids contain high concentrations of heavy metals in various forms. This result contradicts the explicit purpose of treatment standards.

RCRA § 3004(m) provides that treatment standards or methods must "substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that the short-term and long-term threats to human health and the environment are minimized." A BDAT that results in generation of heavy metal sludges exacerbates,

COMMENT NUMBER: 3-B-6 continued
DOCKET NUMBER: LD12-00095
COMMENTER: American Paper Institute
ISSUE:
SUBISSUE: D002-Characteristic Corrosive Wastes
COMMENT: Proposed Insoluble Salt Requirement

rather than minimizes, threats to human health and the environment. Neutralization of hydrochloric acid with natural water or other chemical neutralization techniques resulting in soluble rather than insoluble salts would remedy the corrosive quality of these acids without creating new wastes that may threaten human health and the environment. EPA should, therefore, rescind its insoluble salts requirement and its prohibition on dilution with natural water for these corrosive wastes.

COMMENT NUMBER: 3-B-6
DOCKET NUMBER: LD12-00095
COMMENTER: American Paper Institute
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency acknowledges and agrees with the points made by the commenter that the formation of insoluble salts is either impractical or impossible for some D002 wastes such as nitric acid, sodium hydroxide, potassium hydroxide, hydrochloric acid, and other acid halides. The Agency agrees that for certain waste streams, toxic salts containing heavy metals would have to be formed in order to comply with the insoluble salt requirement. The Agency has therefore reconsidered the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 wastes.

EPA agrees with the comments described above; and therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits are sufficient to control releases of soluble compounds into the environment from the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

COMMENT NUMBER:

DOCKET NUMBER:

COMMENTER:

ISSUE:

SUBISSUE:

COMMENT:

3-B-7
LD12-00138
Occidental Chemical Corporation

D002-Characteristic Corrosive Wastes

Proposed Insoluble Salt Requirement

- D. The Proposed Treatment Standards for D002 Acid and Alkaline Wastes are Nonsensical, Environmentally Unacceptable, and are Technically Infeasible.

EPA has proposed treatment standards for D002 acid and alkaline wastes that consist of neutralization to within the range of pH 6 to pH 9 using agents that form insoluble salts (54 Fed. Reg. 48422). Its rationales for these proposed standards include: (1) hydronium ions may solubilize metals from clay liners; (2) hazardous constituents in ground waters may be mobilized by pH values below 6 or above 9; (3) this pH range matches the buffering capacity of natural systems; and (4) soluble salts, if improperly managed, could adversely impact fresh water systems. As will be discussed in the following comments, EPA has not conducted a thorough technical analysis of its assumptions,

and its proposed standards for D002 alkaline and acid wastes are not only technically infeasible for some wastes, but also may cause adverse environmental impacts.

EPA's arguments to support its proposed requirement that neutralization be performed with chemicals that form insoluble precipitates are even more absurd than its justifications for the proposed pH range. First, EPA cites the "fact" that dissolved salts may adversely impact fresh water ecosystems. (Such wastewaters as may be destined for surface water discharge are not subject to 40 C.F.R. Part 268 since they are not being land disposed.) This is one reason why every discharge to surface waters must be permitted under the CWA. When the Agency permits a discharge, it explicitly evaluates every significant constituent in the wastewater discharge, including dissolved salts. There are standards for dissolved salts in fresh waters, and the Agency's (or state's) permit writers must assure that these are satisfied and that aquatic ecosystems are protected before a permit is issued. It should be pointed out that the soluble salts formed by neutralization are naturally-occurring; sea water contains about 5000 mg/l of sodium sulfate, for example. In addition, most fresh water

COMMENT NUMBER:

3-B-7 Continued

DOCKET NUMBER:

LD12-00138

COMMENTER:

Occidental Chemical Corporation

ISSUE:

D002-Characteristic Corrosive Wastes

SUBISSUE:

Proposed Insoluble Salt Requirement

COMMENT:

aquatic life forms are not particularly sensitive to salts; concentrations of total dissolved solids (salts) as great as 1,500 mg/l are typically acceptable. The most restrictive standards are those for drinking water; and the states and EPA have historically required permit limits that assure that such standards are achieved.

The Agency makes an issue of the fact that sodium sulfate is the chemical discharged in the largest amounts to surface water, according to the Agency's Toxic Release Inventory. This "fact" is a straw man. The Agency has already removed sodium sulfate from its future inventories. Since sulfates are regulated by the secondary drinking water standards (40 C.F.R. Part 143), and since the drinking water standards for sulfates provide ample protection of aquatic ecosystems, there is no regulatory basis for advocating the wholesale reduction of such discharges. The appropriate regulation of sodium sulfate in wastewater discharges, where necessary, is through the NPDES permit program, which is required to assure that water quality standards are achieved.

EPA also cites soluble nitrates as a reason for requiring the use of precipitating agents for neutralization of corrosive wastes. Apparently, the Agency is unaware of the fact that there are no essentially insoluble nitrate salts; if there were, nitrogen removal from wastewater effluents would be a practical and cost-effective treatment technology.

Phosphates are also cited as a chemical that should be removed from effluents to prevent nutrient enrichment of fresh waters. Again, the NPDES permitting program has been requiring such removals, when necessary, to protect fresh water ecosystems.

The technical infeasibility of the Agency's proposal has already been discussed with respect to wastes containing nitrates. Chlorides that result from the use of hydrochloric acid present another technological feasibility problem. The only moderately insoluble chloride salt is silver chloride. Besides being uneconomical, use of silver as a neutralizing agent would create a hazardous solid waste due to the EP toxicity characteristic.

COMMENT NUMBER: 3-B-7
DOCKET NUMBER: LD12-00138
COMMENTER: Occidental Chemical Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

EPA received many comments against the proposed insoluble salt requirement. Many of these commenters, such as this one, indicated that soluble salts should not be regulated as part of the land disposal restrictions because discharges to freshwater ecosystems from wastewater treatment facilities are currently regulated by either NPDES or POTW permits. Also, the Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some D002 wastes such as nitric acid, hydrochloric acid, and other acid halides. As noted by this commenter, there are no essentially insoluble nitrate salts and a requirement to form silver chloride would be impractical and is actually the formation of a hazardous waste.

The Agency agrees with the points describe above that were made by this and other commenters. Based on this, the Agency has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 acidic and alkaline wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

COMMENT NUMBER:

3-B-8

DOCKET NUMBER:

LD12-00143

COMMENTER:

General Motors Corporation

ISSUE:

SUBISSUE:

D002-Characteristic Corrosive Wastes

COMMENT:

Proposed Insoluble Salt Requirement

We also recommend that generators should be allowed to select the particular chemicals to be used for neutralization, based on waste-specific conditions and waste minimization goals. The amount of sludge generated to take up limited hazardous landfill space will depend on the reagents used (e.g., neutralization with magnesium hydroxide versus sodium hydroxide). Waste minimization goals and economic considerations will encourage generators to utilize chemicals which result in the lowest sludge volumes.

COMMENT NUMBER: 3-B-8
DOCKET NUMBER: LD12-00143
COMMENTER: General Motors Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received numerous comments concerning the proposed insoluble salt requirement for D002 acidic and alkaline wastes. Several commenters such as this one, indicated that the insoluble salt requirement would result in the formation of large volumes of sludge that would need to be landfilled. The commenters believed that these sludges would unnecessarily take up limited landfill space. Other commenters pointed out that the formation of insoluble salts is either impractical or impossible for some D002 wastes such as organic acids, nitric acid, sodium hydroxide, potassium hydroxide, hydrochloric acid, and other acid halides. Commenters also indicated that the discharge of soluble salts is already being regulated through NPDES and POTW permits.

EPA agrees with these comments; and therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 acidic and alkaline wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number: 3-B-9
Docket Number: LD12-00129
Commenter: Olin Chemicals
Issue:
Subissue: D002-Characteristic Corrosive Wastes
Comment: Proposed Insoluble Salt Requirement

Olin takes great exception with the Agency proposal of Neutralization to 6 to 9 pH and Insoluble Salts as the BDAT for the D002 Acid and Alkaline Subcategory. These wastes are usually treated in wastewater treatment plants or by mixing in pipes associated either with NPDES permits (or state equivalent) or POTW discharges. Some wastewater

treatment facilities have surface impoundments that are associated with the unit that are not RCRA regulated units. We believe that Office of Solid Waste and Emergency Response (OSWER) is overstepping its authority by setting discharge criteria and standards (effluent guidelines) which belong in the water division.

The Agency's proposal to restrict treatment to insoluble salts is neither based on good science or on current regulatory philosophy. Olin wishes to point out that "solubility" is a relative value; everything is soluble to some extent - nothing is totally insoluble. USEPA does not give a solubility in standard units (i.e.; g/l) but specifies the unscientific term "insoluble salts".

Comment Number:

Docket Number:

Commenter:

Issue:

Subissue:

Comment:

3-B-9 continued
LD12-00129
Olin Chemicals

D002-Characteristic Corrosive Wastes
Proposed Insoluble Salt Requirement

Effluent guidelines are adopted on an industry-by-industry basis (SIC codes) and take into account the chemicals used in the process, the treatment capability of the industry and good science in developing BAT guidelines for their particular wastes. The OSWER, in the third third proposal, is taking a "shot-gun" approach that all industry and effluent guidelines are equal and can be treated the same way. Not only is this not true, but for certain waste streams, the production of "insoluble salts" is not always possible. This is especially true of the chlorine and phosphate industries, and this is why effluent guidelines are developed on an industry specific basis.

Most industrial discharge permits include an aquatic toxicity testing provision. This toxicity testing is specific to an individual facility, and the results are evaluated against the effect that the particular discharge has against the ecosystem it is impacting. This is the proper way of evaluating discharges where "good science" is taken into account and a "carte blanche" poor, non-scientific statement such as "insoluble salts" is not used. As a further point, Olin has locations where the discharge of dissolved solids (TDS) is regulated not only through toxicity testing but is also regulated in proportion to the flow of the receiving stream, thereby limiting any potential impact of the discharge. These limits are based upon potential aquatic impact.

Comment Number:

3-B-9 Continued

Docket Number:

LD12-00129

Commenter:

Olin Chemicals

Issue:

D002-Characteristic Corrosive Wastes

Subissue:

Proposed Insoluble Salt Requirement

Comment:

The Agency states in the Third Third proposal that the "...TRI indicates that sodium sulfate is the chemical being discharged in the largest volume to surface water. Therefore, the Agency prefers to neutralize D002 wastes such that relatively nontoxic solid wastes are generated rather than wastewater discharges with high dissolved solid contents that could potentially have adverse impacts on freshwater ecosystems." The Agency, specifically the Land Disposal Section, should realize that the USEPA on June 20, 1989 (54 FR 117, pg. 25850) deleted sodium sulfate from the TRI on the basis that it "... did not meet the listing criteria related to acute human health effects, chronic human health effects, or environmental toxicity." The Agency stated in the proposed delisting (54 FR 32, pg. 7217, February 17, 1989) that "Na₂SO₄ [sodium sulfate] is essentially non-toxic in acute toxicity studies. It does not pose any significant chronic health hazards..." and that "[w]hile releases of Na₂SO₄ to the environment are relatively large, the largest release of Na₂SO₄ results in drinking water concentrations far below the national drinking water standard of 250 mg/l." Olin questions whether the Land Disposal section has not produced contrary data, and if, so why was it not presented? If there is no contrary data, what is the Land Disposal Section basis for limiting sodium sulfate (and other non-toxic) dissolved solids?

Comment Number

Docket Number

Commenter

Issue

Subissue

Comment

3-B-9 continued
LD12-00129
Olin Chemicals

D002-Characteristic Corrosive Wastes

Proposed Insoluble Salt Requirement

The Agency fails, in its proposed regulation, to specify what is to be done with these "non-toxic" dissolved solids which are to be precipitated as "insoluble salts." Further, in its capacity demonstration USEPA fails to take into account whether or not there is existing treatment capacity to precipitate these "insoluble salts", and whether or not there is existing landfill capacity (both hazardous and non-hazardous) for these salts. Most D002 streams are wastewaters which are treated with other acids or bases that are currently available at the generating facility. These treatment units, as stated above, have NPDES or POTW permits which are based on a given treatment process. Revision to the treatment system may require an NPDES/POTW permit modification. In addition, not only has the Agency failed to define "insoluble" but has also failed to specify which salts meet this category, the acids or alkalis that will produce these "insoluble salts" and whether there is sufficient production of these acids or alkalis to treat the billions of gallons per day of wastewater that will be impacted.

For the above reasons, Olin recommends that the treatment standard for the D002 Acid and Alkaline Subcategory be "Neutralization to: $2 < \text{pH} < 12.5$."

COMMENT NUMBER: 3-B-9
DOCKET NUMBER: LD12-00129
COMMENTER: Olin Chemicals
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received many comments against the proposed insoluble salt requirement. Several commenters, such as this one, believed that the term "insoluble salt" was not adequately defined. Due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined. Therefore, this definition would be open to interpretation and likely cause confusion. Additionally, the formation of insoluble salts is either impractical or impossible for some common D002 wastes such as nitric acid and hydrochloric acid.

Commenters also believed that individual facility discharge permits (NPDES or POTW) are sufficient to control the release of soluble salts into the environment.

As stated by this commenter and several other, the insoluble salt requirement would negate using alkaline and acidic waste streams generated onsite to co-neutralize each other. Instead, facilities would have to use various precipitating agents in order to form insoluble salts.

EPA agrees with the comments described above; and therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits are sufficient to control releases of soluble compounds into the environment

COMMENT NUMBER: 3-B-9 (continued)
DOCKET NUMBER: LD12-00129
COMMENTER: Olin Chemicals
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

from the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation of Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number: 3-B-10

Docket Number: LD12-00036

Commenter: RSR Corporation

Issue: Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirement

Comment:

A. In the Discussion of Corrosive
Characteristic Wastes EPA Miscalculated
the Quantity of Sodium Sulfate Produced

EPA made several misstatements and miscalculations in the discussion of corrosive characteristic wastes at 54 Fed. Reg. 48423 (cols. 1 - 2). First, EPA has previously stated that sodium sulfate does not cause nor can it reasonably be expected to cause significant adverse health or environmental effects. See 54 Fed. Reg. 25850 (June 20, 1989). Second, EPA should specify the nature and quantity of the "otherwise recovered" calcium sulfate sludge containing precipitated metals that is reused or recycled rather than being land disposed. Third, the stoichiometry of reacting aqueous sulfuric acid (H_2SO_4 , MW=98) with calcium hydroxide or sodium hydroxide produces hydrated calcium sulfate precipitated solids ($CaSO_4 \cdot 2H_2O$, MW=172) or sodium sulfate solids (Na_2SO_4 , MW=142) in solution. Since one mole of sulfuric acid will produce one mole of hydrated calcium sulfate or sodium sulfate, then one pound of sulfuric acid will produce 1.76 pounds of hydrated calcium sulfate sludge or 1.45 pounds of soluble sodium sulfate. EPA has thus

Comment Number: 3 - B7D continued

Docket Number: LD12 -00036

Commenter: RSR Corporation

Issue: Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirement

Comment:

miscalculated the quantity of sodium sulfate produced (it would be approximately 21, not 22 pounds) and EPA has erroneously assumed that the calcium sulfate produced would be in its anhydrous form. In fact, there are approximately four more pounds of solids produced for disposal when using lime instead of caustic soda in the neutralization of one gallon of concentrated sulfuric acid. See Attachment 1.

COMMENT NUMBER: 3-B-10
DOCKET NUMBER: LD12-00036
COMMENTS: RSR Corporation
ISSUE: D003: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The insoluble salt requirement for D002 acidic and alkaline wastes was initially proposed because the Agency prefers the neutralization of D002 waste such that relatively nontoxic solid wastes are precipitated out of solution rather than discharging wastes with high dissolved solid contents. The Agency believes that discharges with high dissolved solids such as sodium sulfate, could enhance algal growth and potentially have adverse impacts on freshwater ecosystems. Although the impact may not be significant, the Agency still believes that these are legitimate concerns. The Agency received many comments pointing out that discharges to freshwater ecosystems from wastewater treatment facilities are currently regulated by either NPDES or POTW permits. Commenters also pointed out that the formation of insoluble salts is either impractical or impossible for some D002 wastes such as organic acids, nitric acid, sodium hydroxide, potassium hydroxide, hydrochloric acid, and other acid halides.

Based on the comments described above, the Agency has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits are sufficient to control releases of soluble compounds into the environment from the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

COMMENT NUMBER: 3-B-10 (continued)
DOCKET NUMBER: LD12-00036
COMMENTER: RSR Corporation
ISSUE: D003: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

In regard to the recovery of metals from calcium sulfate sludge, the Agency has identified D002 waste streams that contain significant concentrations of metals. Therefore, the Agency believes that sludges formed from the treatment of D002 wastes could potentially be amenable to recovery. Also, EPA acknowledges and has considered the stoichiometry information submitted by this commenter.

Comment Number: 3-B-11

Docket Number: LD12-00039

Commenter: Swidler & Berlin for Allied-Signal, Inc.

Issue: Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirement

Comment:

By contrast, no data are being supplied with respect to corrosive wastes. Despite the absence of any data in this submission,^{1/} the remarks concerning the feasibility of satisfying the aspect of the proposed treatment standard that would require that the product of neutralization of acidic and alkaline corrosive wastes be insoluble salts are solidly based on well-known scientific facts. Allied is presenting a brief discussion of those facts now to assure the broadest possible discussion of the proposed insoluble salt requirement. This submission will point out that there are no feasible ways of creating an insoluble salt from the neutralization of most if not all alkaline corrosive wastewaters, and that there are no feasible methods of neutralizing HCl or HNO₃ acidic corrosive wastewaters so as to generate insoluble salts. In Allied's principal comments on the proposed Third Third rule, Allied will present some data on the volumes of wastewaters at Allied facilities that are alkaline corrosive or that are HCl or HNO₃ acidic corrosive.

^{1/} We note that the "Best Demonstrated Available Technology (BDAT) Background Document for ... Characteristic Corrosive Wastes (D002) ..." contains no more data on the insoluble salts issue than does this submission.

Comment Number: 3-B¹ continued

Docket Number: LD12-00639

Commenter: Swidler & Berlin for Allied Signal, Inc.

Issue: Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirements

Comment:

II. Insoluble Salts Cannot be Generated from the Neutralization of Alkaline Corrosive Wastewaters or from the Neutralization of HCl or HNO₃ Acidic Wastewaters

As stated earlier, we have no data to submit on this issue at this time.

However, in order to promote the discussion of the insoluble salts issue, we believe it appropriate at this time to simply state some basic and accepted principles of chemistry.

First, alkaline corrosive wastewaters cannot be neutralized in a way that generates an insoluble salt. Thus, for wastestreams that are corrosive because they contain caustic (sodium hydroxide) or potassium hydroxide, or similar hydroxides, we know of no feasible way to satisfy the requirement of the proposed treatment standard that only insoluble salts be generated.

Second, acidic corrosive wastestreams that are acidic due to the presence of HCl or HNO₃, also cannot be neutralized in a way that generates an insoluble salt. The calcium salts of both of these common industrial acids are highly soluble, and we know of no chlorides or nitrates that are not soluble. Some may exist, but if so treatment by substances yielding such salts is almost certainly bound to be infeasible. This brief list of acids for which the generation of insoluble salts is either impossible or infeasible is unlikely to be complete.

In Allied's final comments on this proposed rule, we shall endeavor to supply some data on the volume of Allied's corrosive wastewaters that would be subject to the proposed rule for which the generation of insoluble salts would be infeasible or impossible.

COMMENT NUMBER: 3-B-11
DOCKET NUMBER: LD12-00039
COMMENTER: Swidler & Berlin for Allied Signal, Inc.
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some common D002 wastes such as nitric acid, hydrochloric acid, and many alkaline wastes.

The Agency also received many comments on the definition of "insoluble salt." Due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined, therefore this definition would be open to interpretation and likely to cause confusion.

EPA agrees with the comments described above; and therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits are sufficient to control releases of soluble compounds into the environment from the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

COMMENT NUMBER: 3-B-12
DOCKET NUMBER: LD12-00151
COMMENTS: Gulf Coast Waste Disposal Authority
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
COMMENT:

III.A.4.c.(1). D002 Acid and Alkaline Subcategory

EPA has proposed treatment standards for D002 acid and alkaline wastes that consist of neutralization to within the range of pH 6 to 9 using agents that form insoluble salts [II.A.4.c.(1)]. Its rationale for these proposed standards includes: (1) hydronium ions may solubilize metals from clay liners; (2) hazardous constituents in ground waters may be mobilized by pH values below 6 or above 9; (3) this pH range matches the buffering capacity of natural systems; (4) and soluble salts, if improperly managed, could adversely impact fresh water systems. As will be discussed in the following comments, EPA has not conducted a thorough technical analysis of its assumptions, and its proposed standards for D002 alkaline and acid wastes are not only technically infeasible for some wastes, but also may cause adverse environmental impacts.

D. The proposal that neutralization should be performed with chemicals that form an insoluble precipitate is unnecessary, and will be environmentally counterproductive in many cases.

While GCA has no problem with EPA specifying neutralization as a technology for acid and alkaline hazardous wastes, it notes that EPA's rationale for this treatment designation, which discusses "dilution" with water, is technically unfounded. Mixing of wastewaters with different acidities and alkalinities in wastewater collection and treatment systems to achieve conneutralization is a common and accepted industrial waste treatment practice. EPA's proposal implies that this practice could be considered as unacceptable treatment, since the Agency specifies that BDAT neutralization should form a precipitated salt. This concept is of concern to GCA since in its facilities wastewaters with different amounts of acidity and alkalinity are mixed to achieve neutralization. This is not dilution, and should not be characterized as such.

COMMENT NUMBER: 3-B-12 *continued*
DOCKET NUMBER: LD12-00151
COMMENTS: Gulf Coast Waste Disposal Authority
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
COMMENT:

EPA's arguments to support its proposed requirement that neutralization be performed with chemicals that form insoluble precipitates has even less merit than its justifications for the proposed pH range. First, EPA cites the *fact* that dissolved salts may adversely impact *fresh* water ecosystems. GCA agrees with this statement; this is one reason why every discharge to surface waters must be permitted under the CWA. When the Agency permits a discharge, it explicitly evaluates every significant constituent in the wastewater discharge, including dissolved salts. There are standards for dissolved salts in fresh waters, and the Agency's (or states') permit writers must assure that these are satisfied and that aquatic ecosystems are protected before a permit is issued.

In the case of those GCA facilities which discharge to estuarine waters, EPA's proposal to require neutralization to form insoluble salts has no scientific foundation. The soluble salts formed by neutralization at GCA's facilities are naturally-occurring; sea water contains about 5000 mg/L of sodium sulfate, for example. There is no environmental basis for limiting the discharge of soluble salts such as sodium chloride and sodium sulfate, at the concentrations found in GCA's effluents, to estuarine waters.

The Agency makes an issue of the fact that sodium sulfate is the chemical discharged in the largest amounts to surface water, according to the Agency's Toxic Release Inventory. This "fact" is a straw man. The Agency has already removed sodium sulfate from its future inventories. There is ample justification for this; sodium sulfate is the second most-common *naturally-occurring* salt in fresh water (Figure 8-1,

Stumm, W. and Morgan, J.J., 1970, *Aquatic Chemistry*, Wiley-Interscience, New York). Sodium sulfate is less toxic than common table salt, sodium chloride. The mouse oral LD50 for sodium sulfate is 5989 milligrams per kilogram of body weight (mg/kg-bw); the corresponding LD50 for sodium chloride is 4000 mg/kg-bw (Sax, N.I., 1984, *Dangerous Properties of Industrial Materials*, 6th edition, Van Nostrand Reinhold Company, New York).

COMMENT NUMBER: 3-B-12 (continue)
DOCKET NUMBER: LD12-00151
COMMENTS: Gulf Coast Waste Disposal Authority
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
COMMENT:

III.A.4.c.(1). D002 - Acid and Alkaline Subcategory

EPA has proposed treatment standards for D002 acid and alkaline wastes that consist of neutralization to within the range of pH 6 to 9 using agents that form insoluble salts [II.A.4.c.(1)]. Its rationale for these proposed standards includes: (1) hydronium ions may solubilize metals from clay liners; (2) hazardous constituents in ground waters may be mobilized by pH values below 6 or above 9; (3) this pH range matches the buffering capacity of natural systems; (4) and soluble salts, if improperly managed, could adversely impact fresh water systems. As will be discussed in the following comments, EPA has not conducted a thorough technical analysis of its assumptions, and its proposed standards for D002 alkaline and acid wastes are not only technically infeasible for some wastes, but also may cause adverse environmental impacts.

E. Precipitation of an insoluble salt will be, for some anions and cations, technically infeasible.

EPA cites soluble nitrates as a reason for requiring the use of precipitating agents for neutralization of corrosive wastes. Apparently, the Agency is unaware of the fact that there are essentially no insoluble nitrate salts (Stumm and Morgan, op.cit.); if there were, nitrogen removal from wastewater effluents would be a practical and cost-effective treatment technology.

The technical infeasibility of the Agency's proposal has been discussed with respect to wastes containing nitrates. Chlorides, which result from the use of hydrochloric acid, present another technological feasibility problem. The only moderately insoluble chloride salt is silver chloride; perhaps the Agency is suggesting that generators use a silver compound to neutralize wastes containing hydrogen chloride. Besides being uneconomical, use of silver as a neutralizing agent would create a hazardous solid waste due to the EP toxicity characteristic.

COMMENT NUMBER: 3-B-12
DOCKET NUMBER: LD12-00151
COMMENTER: Gulf Coast Waste Disposal Authority
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency agrees with the commenter that the insoluble salt requirement could negate using alkaline and acidic waste streams generated onsite to co-neutralize each other. The Agency believes that co-neutralization such as in line neutralization is a sensible and beneficial management practice and therefore should not be restricted by an insoluble salt requirement.

The Agency also believes that existing regulations such as NPDES and POTW permits are sufficient to control discharges of soluble salts into freshwater ecosystems. The Agency, therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 acidic and alkaline wastes, therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

COMMENT NUMBER: 3-B-12 (continued)
DOCKET NUMBER: LD12-00151
COMMENTER: Gulf Coast Waste Disposal Authority
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some common D002 wastes such as nitric acid and hydrochloric acid. As noted by this commenter, there are no essentially insoluble nitrate salts and a requirement to form silver chloride would be impractical and actually any be the formation of a hazardous waste. The Agency also received many comments on the definition of "insoluble salt." Due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined, therefore this definition would be open to interpretation and likely cause confusion.

EPA agrees with the comments described above; and therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge permits (NPDES or POTW) are sufficient to control releases of soluble compounds into the environment from the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

COMMENT NUMBER: 3-B-13
DOCKET NUMBER: LD12-00167
COMMENTS: Westinghouse Electric Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
COMMENT:

Corrosive Characteristic Wastes Subcategory - (54 FR 48422)

The proposed treatment standard for corrosive wastes is either recovery or neutralization with acids or bases to a pH between 6 and 9 and the formation of insoluble salts. The formation of insoluble salts is certainly desirable; however, it is not always practical or even possible during neutralization of some corrosives like nitric acid, sodium or potassium hydroxide. Since recovery is not always a viable option and insoluble salts cannot be formed for all types of corrosives, this treatment standard cannot be universally applied. EPA also inferred that it prefers substitute chemicals in lieu of the common acids and bases. This may not be practical based on the abundance of these materials used in industry. In addition, EPA should provide a more precise definition of "insoluble salt" perhaps in terms of a maximum solubility or an allowable threshold level for the formation of soluble salts (e.g., grams per liter).

COMMENT NUMBER: 3-B-13
DOCKET NUMBER: LD12-00167
COMMENTER: Westinghouse Electric Corporation
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some common D002 wastes such as nitric acid, hydrochloric acid, and sodium hydroxide. The Agency also received many comments on the definition of "insoluble salt." Due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined. Therefore, this definition would be open to interpretation and likely cause confusion.

Based on information received from commenters, the Agency has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge permits (NPDES or POTW) are sufficient to control releases of soluble compounds into the environment from the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. The Agency has established this standard to allow the regulated community the flexibility to use the best technology for each specific D002 waste stream. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number 3-B-14

Docket Number LD12-001168

Commenter American Petroleum Institute

Issue D002 - Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

The requirement that characteristic wastes be treated to more than characteristic standards is discussed elsewhere.

[Cite.] Here, API would like to note that the requirement that insoluble salts be produced is unwise from an environmental point of view, and will cause serious operating problems for industry. More specifically:

- o EPA apparently intends to eliminate the current practice, which is both environmentally protective and economically efficient, of mixing spent acids and spent caustics to neutralize each other.
- o Ultimate disposition of soluble salts is covered by water regulations that ensure that the problems that concern EPA in the Notice do not in fact arise. Requiring production of insoluble salts would produce large quantities of waste that would then have to be land disposed.
- o For acids, lime could be used to meet EPA's proposed standards. For basic materials, the proposal would require the introduction of some neutralization materials not now in use. For example, it is difficult to determine what might be used to precipitate an insoluble salt from sodium and hydroxide ions associated with spent caustics.

Comment Number 3-B-14 continued

Docket Number LD12-00168..

Commenter American Petroleum Institute

Issue: D002- Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirement

Comment:

- o EPA expresses concern about sodium sulfate. 54 Fed. Reg. 48423. However, this substance is actually less toxic than sodium chloride (table salt) and has been removed from the Toxic Substances inventory list. In addition:
 - EPA has not established a freshwater chronic criteria for the sulfate ion, apparently because the ion species has such a low aquatic toxicity.
 - There are few references in the technical literature on the freshwater aquatic toxicity of sodium sulfate and on the fate of the sulfate ion in surface waters. This indicates that the substance has not been regarded as one presenting problems in need of investigation.
 - API has found a reference in the Chemical Abstracts database to an article indicating that an addition of 99 grams/liter of sodium sulfate was required to cause 50% mortality of fish exposed for 24 to 48 hours. This is a very low toxicity. [The article is M. Sanna, "Determination of the Acute Toxicity of Discharge Waters on Ecological Stability," Vini Ital. 19(106), 39, 41-42 (1977). API is obtaining a copy of this article, and will submit it for the docket when it becomes available.]

...
...Comment Number: 3-B-14 continued
Docket Number: LD12-00168...
Commenter: American Petroleum Institute
Issue: D002 - Characteristic Corrosive Wastes
Subissue: Proposed Insoluble Salt Requirement
Comment:

In addition to the long-term problems that would be created by EPA's proposed requirement, it would cause severe short- and medium-term dislocations because of the need for the construction or significant alteration of treatment facilities. It would be exceedingly difficult for industry to comply with the deadlines.

COMMENT NUMBER: 3-B-14
DOCKET NUMBER: LD12-00168
COMMENTER: American Petroleum Institute
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The insoluble salt requirement for D002 acidic and alkaline wastes was initially proposed because the Agency prefers the neutralization of D002 waste such that relatively nontoxic solid wastes are precipitated out of solution rather than discharging wastes with high dissolved solids, such as sodium sulfate, could enhance algal growth and potentially have adverse impacts on freshwater ecosystems. The Agency still believes that these are legitimate concerns. However, the Agency believes and commenters have stated that the regulation of facility discharges through NPDES or POTW permits is sufficient to control the discharge of soluble salts.

The Agency agrees with the commenter that the insoluble salt requirement could negate using alkaline and acidic waste streams generated onsite to co-neutralize each other. The Agency believes that co-neutralization such as in line neutralization is a sensible and beneficial management practice and therefore should not be restricted by an insoluble salt requirement.

The Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some common D002 wastes such as nitric acid, hydrochloric acid, and sodium hydroxide. Additionally, due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined. Therefore, this definition would be open to interpretation and likely cause confusion.

COMMENT NUMBER: 3-B-14 (continued)
DOCKET NUMBER: LD12-00168
COMMENTER: American Petroleum Institute
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number: 3-B-15

Docket Number: LD12-00169

Commenter: Air Products and Chemicals, Inc.

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirement

Comment:

BDAT for the D002 Acids/Alkalines Subcategories should not specify "neutralization to insoluble salts".

By requiring "neutralization to insoluble salts" as part of the BDAT standard for D002, EPA may be prohibiting the synergistic treatment of one hazardous waste stream with another. For example, a waste sulfuric acid stream (D002 waste) could be neutralized with a waste sodium hydroxide stream (another D002 waste). EPA's requirement to neutralize to insoluble salts would not be met, in this case. Yet, EPA cites the beneficial use of one waste to neutralize another as a desirable option:

"Some facilities generate waste streams which fluctuate from the Acid subcategory to the Alkaline subcategory depending upon what process is used on a given day. These facilities might be able to utilize these fluctuations in pH as a means of performing on-site neutralization (54 FR 48423)."

EPA uses the example of neutralizing sulfuric acid with lime to produce a relatively insoluble calcium sulfate precipitate (in lieu of using sodium hydroxide which results in the soluble salt sodium sulfate). EPA appears to justify the use of lime by stating the following:

"In fact, data from the Toxic Release Inventory (TRI) indicates that sodium sulfate is the chemical being discharged in the largest volumes to drinking water (54 FR 48423)."

Comment Number 3-B-15 continued

Docket Number LD12-00169

Commenter Air Products and Chemicals, Inc.

Issue D002 - Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

However, we wish to note that EPA has previously concluded in TRI rulemaking that sodium sulfate, even if present in large quantities does not present any negative impacts on health or the environment.

"Based on the available literature, EPA's health and environmental assessment of Na_2SO_4 yielded no areas of concern..... While releases of Na_2SO_4 to the environment are relatively large, the largest release of Na_2SO_4 results in drinking water concentrations far below the national drinking water standard of 250 mg/l (54 FR 7218)."

One additional point that EPA should evaluate is the technical feasibility of precipitating an insoluble salt when neutralizing an alkaline waste such as sodium hydroxide. There do not appear to be any common reagents that can be used to create an insoluble sodium precipitate. Therefore, in this case the BDAT standard does not appear to be based on a "demonstrated available technology."

We do not disagree that neutralization ions such as phosphate or nitrate could be of some concern under certain stream conditions. However, those concerns can be best addressed through local stream water quality criteria instead of a blanket national standard.

COMMENT NUMBER: 3-B-15
DOCKET NUMBER: LD12-00169
COMMENTER: Air Products and Chemicals, Inc.
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some common D002 wastes such as sodium hydroxide. Additionally, due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined, therefore this definition would be open to interpretation and likely cause confusion.

The Agency agrees with the commenter that the insoluble salt requirement could negate using alkaline and acidic waste streams generated onsite to co-neutralize each other. The Agency believes that co-neutralization such as in line neutralization is a sensible and beneficial management practice and therefore should not be restricted by an insoluble salt requirement.

The Agency believes that existing regulations such as NPDES and POTW permits are sufficient to control discharges of soluble salts into freshwater ecosystems. The Agency, therefore, has reconsidered the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 acidic and alkaline wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

... Comment Number 3-B-16

Docket Number LD12-00172

Commenter HWTC

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirement

Comment:

3. **EPA Should Delete Reference To
Insoluble Salts In The BDAT Standard**

EPA should Delete "and Insoluble Salts" from the treatment standards which apply to the acid and alkaline subcategories of 261.22(a)(1).

The treatment standard for the acid and alkaline subcategories 261.22(a)(1) should not reference "and Insoluble Salts" for several reasons. We object to the specification of neutralization to an insoluble salt since this requirement would preclude the use of many widely used common neutralization agents such as sodium hydroxide, and certain types of lime such as dolomitic lime.

We believe that the inclusion of "and Insoluble Salts" in the treatment standard does not have as great an impact as EPA believes. While we support EPA's view that the discharge of soluble salts to surface waters is far less desirable than the precipitation and landfilling of insoluble salts, we think that it is necessary to recognize that the neutralization of nitric acid and hydrochloric acid generates salts which are soluble irrespective of the treatment agent used.

Comment Number 3-B-16 continued

Docket Number LD12-00172..

Commenter HWTC

Issue D002 - Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

If EPA is concerned with the dissolved solids content of effluent discharges, these are already regulated by POTW's or in NPDES permits under the Clean Water Act. Limits are set in operating permits that control the dissolved solids content of wastewater discharges. A total ban on soluble neutralization agents/salts is therefore unnecessary for protection of the environment, and will disrupt current treatment processes thereby affecting negatively available capacity.

It is necessary to recognize also that the neutralization of nitric acid and hydrochloric acid generates salts which are soluble irrespective of the treatment agent used.

The inclusion of "and Insoluble Salts" poses a significant enforcement issue for both the Agency and the regulated community, as it would impact on the waste analysis requirements of treatment and disposal facilities which are operating per interim and final authorization. Furthermore, in stating the "preference" for neutralization of acid and alkaline wastes [subcategory 261.22(a)(1)] with calcium hydroxide, the Agency opens to interpretation the issue of proper treatment as required by the standard. By deleting "and Insoluble Salts" from the treatment standard the Agency will not only eliminate interpretive issues that are subject to enforcement actions, but it will also enable generators and treaters to operate without interruption in accordance with their Clean Water permits.

COMMENT NUMBER: 3-B-16
DOCKET NUMBER: LD12-00172
COMMENTER: HWTC
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some common D002 wastes such as nitric acid and hydrochloric acid. Additionally, due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined, therefore this definition would be open to interpretation and likely cause confusion.

The Agency agrees with the commenter that the insoluble salt requirement could negate using alkaline and acidic waste streams generated onsite to co-neutralize each other. The Agency believes that co-neutralization such as in line neutralization is a sensible and beneficial management practice and therefore should not be restricted by an insoluble salt requirement.

The Agency also believes that existing regulations such as NPDES and POTW permits are sufficient to control discharges of soluble salts into freshwater ecosystems. The Agency, therefore, has reconsidered the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 acidic and alkaline wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number 3-B-17

Docket Number LD12-00190

Commenter Union Carbide

Issue 0002 - Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

- 16) The Agency's Recommended Neutralization Agent is in Conflict with its Policy of Pollution Prevention - The Agency has proposed that corrosive wastes be treated with reagents that result in insoluble salts instead of soluble salts and site the example of using calcium hydroxide instead of sodium hydroxide to neutralize sulfuric acid. This proposal will result in enormous amounts of sludge that would have to be disposed in a landfill and is in direct conflict with the Agency's pollution prevention policy. Also, it should be noted that the chemical that was sited in the proposal (sodium sulfate) has been removed from the SARA 313 Toxic Release Inventory. UCC believes the Agency should eliminate this recommendation and allow the NPDES permit process to deal with this issue on a case-by-case basis.

COMMENT NUMBER: 3-B-17
DOCKET NUMBER: LD12-00190
COMMENTER: Union Carbide
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency acknowledges and agrees with this point. When the Agency proposed the insoluble salt requirement, they did not intend for large volumes of insoluble salts to be discharged. The Agency believes that these salts would be dewatered and landfilled. However, the Agency did receive many comments which stated that the insoluble salt requirement was unnecessary because discharges of soluble salts are already regulated by NPDES and POTW permits. Therefore, the Agency has reconsidered the "insoluble salt" requirement. EPA believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of D002 acidic and alkaline wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

...
Comment Number 3-B-18

Docket Number LD12-00194

Commenter Rohm and Haas

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

EPA's proposed third-third land disposal restriction rule will have enormous consequences at the many R and H facilities that treat hazardous waste off-site, and especially at R and H's Houston and Bristol plants which generate and treat large volumes of wastewater on-site. Most problematic are EPA's proposed requirements to treat corrosive wastewater to form insoluble salts and to treat wastewaters from hydrogen cyanide and acetone cyanhydrin production to the proposed level of 1.9 mg/l total cyanides and 0.10 mg/l amenable cyanides. These requirements, which stem from EPA's general approach of proposing treatment standards beyond characteristic parameters and from EPA's extreme interpretation of "impermissible dilution", would require R and H to largely revamp the wastewater treatment systems at these two plants -- wastewater treatment systems that were constructed at multi-million dollar expense to comply with stringent NPDES permits.

....
Comment Number 3-B-18 (Cont.)

Docket Number LD12-00194.

Commenter Rohm and Haas

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

For example, at our Houston plant we have spent nearly \$16 million to meet NPDES limits and to ensure that our impoundments receive only nonhazardous wastes. Under this proposed rule, we would have to spend between \$20 and \$40 million to modify the Houston wastewater system to achieve the proposed pH range of 6 to 9 and to form insoluble salts on the corrosive wastewater streams. Before this wastewater enters the facility's impoundments, it is nonhazardous and it is neutralized to form the soluble salt, sodium sulfate. EPA recently delisted sodium sulfate from Section 313 reporting because, among other things, it does not adversely affect freshwater ecosystems. Moreover, our discharge of sodium sulfate into the brackish Houston Ship Channel, based on five years of bio-monitoring, has no effect.

Comment Number 3-B-18 (Cont.)

Docket Number LD12-00194

Commenter Rohm and Haas

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

If EPA disregards this evidence of no environmental hazard from sodium sulfate discharges, such as those to the Houston Ship Channel, and requires formation of insoluble salts, R and H would have to revamp our neutralization and biotreatment processes. Moreover, we would generate 220,000 wet tons of sludges per year, which will present enormous handling and disposal problems. These multi-million dollar changes are not environmentally justified. Moreover, EPA has no legal authority to require that prior to land disposal a waste must be treated to levels beyond the characteristic parameters, such as the corrosive parameters of pH between 2 and 12.5 and no restriction on the formation of soluble salts. That EPA has overstepped its legal authority is further evidenced by the fact that over twenty percent of the wastewater treatment levels are below "no threat" levels that EPA plans to use in other RCRA programs.

Comment Number 3-B-18 (continued)

Docket Number LD12-00194.

Commenter Rohm and Haas

Issue D002 - Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

DISCUSSION

1. EPA Should Revise Its Approach To Corrosive Wastewaters.

The treatment standard for corrosive wastes -- pH of 6 to 9 and insoluble salts -- will have the greatest impact on R and H. See 54 Fed. Reg. at 48,424. We urge EPA to revise its approach to corrosive wastewaters as follows:

1. Set the treatment standard at the characteristic parameters -- pH between 2 and 12.5 and no restriction on the formation of soluble salts.
2. Assuming EPA does not revise the treatment standard to the characteristic parameters, EPA should set the treatment standards to allow the neutralization to form sodium sulfate, or at least, allow formation of sodium sulfate:
 - (1) when the discharge has no environmental effect on the surface water due to the relative salinities and/or volumes; or (2) when the wastewaters are biologically treated, since insoluble salts would inhibit biological oxidation.

4
....
Comment Number

3-B-18 (continued)

Docket Number LD12-00194..

Commenter Rohn and Haas

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

As such, on-site treatment is the only practical option, and that cannot be accomplished by the effective date of this final rule (May 8, 1990), primarily because of the requirement that neutralization form insoluble salts.

Currently all of the corrosive wastewater at the R and H Houston plant is treated in tanks and other non-land units. The neutralization forms sodium sulfate -- a soluble salt. The pH range of the wastewaters is altered so that they are nonhazardous before they enter our land units, which are impoundments. After various treatment processes in the impoundments, the wastewaters are discharged in accordance with the effluent limitations in our NPDES permit. At Houston, we have spent about \$16 million to construct wastewater treatment tanks and other non-land units to ensure that our land units only receive nonhazardous waste and to comply with the increasingly stringent NPDES requirements.

....
... Comment Number 3-B-18 (continued)

Docket Number LD12-00194.

Commenter Rohn and Haas

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

Our wastewater treatment system would have to be substantially overhauled to comply with the proposed treatment standards. R and H would have to: (1) install numerous neutralization tanks and controls to achieve a pH of 6 to 9 and devote substantial manpower to oversee the neutralization operations; (2) change the neutralizing agent from one where we add sodium hydroxide to one where we add lime; (3) install expensive lime handling and solids separation facilities; (4) terminate use of biological treatment of the organics in the wastewater or remove the insoluble salts prior to such biological treatment because the insoluble salt, which would now be formed from using lime, would inhibit biological oxidation; (5) dispose of about 220,000 wet tons per year of the insoluble sludges, much of which would be contaminated with organics and could not be recovered even if there were an adequate market for clean insoluble sludges, which there is not; and (6) restructure our transportation, storage and sludge dewatering systems to handle the large volumes of lime and the massive volumes of insoluble sludges generated by using lime.

....
... Comment Number 3-B-18 (continued)

Docket Number LD12-00194.

Commenter Rohn and Haas

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

These changes cannot be accomplished by May 8, 1990. The capital costs of these changes at the Houston plant alone would likely be between \$20 and \$40 million. The additional annual operating costs to generate and handle the 220,000 wet tons of sludges and dispose of them off-site (since we do not have the space on-site for such enormous sludge quantities) would conservatively be \$7 million per year (\$2 million for on-site handling of lime and sludges; \$2.5 million for off-site transportation; \$2.5 million for off-site disposal). As will be discussed later in this section, the environmental benefits of these expensive changes are negligible.

Comment Number: 3-B-18 (continued)

Docket Number: LD12-00194

Commenter: Rohn and Haas

Issue: 0002 - Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirements

Comment:

B. Solutions

- (1) EPA should set the treatment standards for corrosive wastewater at the characteristic parameters — pH between 2 and 12.5 and no restriction on formation of soluble salts.

The most direct solution to the corrosive wastewater problem, and the solution which, in our view, is legally mandated, is to require treatment, at most, to the corrosive characteristic parameters. In other words, the treatment standard should be revised to a pH between 2 and 12.5 and there should be no restriction on the formation of soluble salts. By definition, since the wastewater in this range is not a RCRA "hazardous" waste, it does not present a significant hazard even if improperly managed. See RCRA § 3001(a). Moreover, as discussed later in these comments, EPA has no legal authority to require treatment beyond parameters at which the waste is nonhazardous.

....
... Comment Number 3-B-18 (continued)
Docket Number LD12- 00194
Commenter Rohn and Haas
Issue D002- Characteristic Corrosive Wastes
Subissue Proposed Insoluble Salt Requirement
Comment

EPA may counter this jurisdictional argument by saying that Congress intended treatment to the lowest BDAT levels even if that is beyond parameters at which the waste is considered hazardous. But this is clearly not the case with respect to corrosive wastes. Indeed, the legislative history shows that Congress authorized EPA to allow continued in-ground neutralization without any pretreatment. Specifically, the House Report provides:

Where land disposal is allowed, the Committee intends the Administrator to require best management practices that include treatment, not just containment of cleanup. Another example would be the continued use of neutralization basins to render corrosive wastes non-hazardous prior to additional treatment or disposal. [In contrast,] [a]n example of where a pretreatment requirement is appropriate prior to land disposal is the metal finishing industry.

H.R. Rep. No. 198, 98th Cong., 1st Sess., pt. 1, at 38 (1983) (emphasis added). The House Report also provides that "the Administrator might find that a [land disposal] prohibition is not appropriate for all corrosive waste, but only for corrosive waste above a specified pH." Id. at 33.

Comment Number 3-B - 18 (continued)

Docket Number LD12 - 00194

Commenter Rohn and Haas

Issue D002 - Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

EPA cannot contend that Congress required treatment standards that are more strict than the corrosive characteristic levels when the legislative history shows that Congress was willing to allow continued in-basin neutralization of corrosive waste. Indeed, the only reference to treatment of corrosive waste in the legislative history is that EPA could require "neutralization of acidic wastes as a condition of land disposal." Id. at 38. This does not say that corrosive wastes must be neutralized, or must be neutralized beyond a 2 to 12.5 pH range and to an insoluble salt form. Such an interpretation would be highly questionable given Congress' position that EPA could continue to allow in-basin neutralization, and given the fact that neutralization of a hazardous corrosive waste is commonly understood in RCRA as achieving a pH of between 2 and 12.5.

Comment Number 3-B-18 (continued)

Docket Number LD12-00194

Commenter Rohn and Haas

Issue D002 - Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

- (2) EPA should, at least, adopt an interim treatment standard for corrosive wastewaters at the characteristic parameters -- pH between 2 and 12.5 and no restriction on formation of soluble salts.

R and H steadfastly believes that EPA has no legal authority to require treatment of a waste beyond the point at which it becomes nonhazardous. Nonetheless, EPA has requested comment on the practical necessity of interim treatment standards at the characteristic parameters, and on the environmental justification for the proposed standard of pH between 6 and 9 and insoluble salts. We will address these practical and environmental issues below, but we in no way wish to infer that EPA can disregard its lack of legal authority to require treatment of a waste beyond the point at which the waste becomes nonhazardous.

First, EPA requests comment on whether to adopt treatment standards at the characteristic parameters on an interim basis, particularly in light of the implementation problems. 54 Fed. Reg. at 48,491/2. EPA would be disregarding reality if it did not, at least on an interim basis, set the treatment standards at the characteristic parameters (pH between 2 and 12.5 and no restriction on soluble salts). R and H cannot comply by May 8, 1990 with the proposed treatment standard of pH of 6 to 9 and insoluble salts through on-site neutralization. Compliance would necessitate huge changes to our wastewater treatment and sludge management system which we have summarized above.

Comment Number 3-B-18 (continued)

Docket Number LD12-00194.

Commenter Rohn and Haas

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed Insoluble Sulf Requirement

Comment

Thus, the only alternative to noncompliance or plant shutdowns is to adopt interim treatment standards at the characteristic parameters of pH between 2 and 12.5 and no restriction on formation of soluble salts. In R and H's case, these interim standards would need to be retained for three to five years until the necessary changes could be made to our wastewater treatment system to meet the proposed standard, assuming money were no object.

- (3) If EPA does not revise the treatment standard for corrosive wastewater to the characteristic parameters, EPA should allow neutralization to form sodium sulfate.

The biggest problem with the proposed treatment standard for corrosive wastewaters is the requirement to form insoluble salts. EPA gives as its justification a single statement that the soluble salts "could potentially have adverse impacts on freshwater ecosystems." See 54 Fed. Reg. at 48,423/2. But there is no substantiation of this concern, and at least with respect to sodium sulfate (which is the residue from our neutralization), this concern is directly contradicted by the Agency's recent delisting of sodium sulfate.

Comment Number 3-B-18 (continued)

Docket Number LD12-00194.

Commenter Rohn and Haas

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

About six months ago EPA delisted sodium sulfate salt solution (one form of soluble salts) from the Section 313 list of toxic chemicals. See 54 Fed. Reg. at 25,850 (1989). At that time EPA concluded that sodium sulfate does "not meet the listing criteria related to . . . environmental toxicity" and that "available data do not demonstrate that [sodium sulfate] causes or can reasonably be anticipated to cause significant adverse health or environmental effects." Id. Further, EPA specifically rejected a comment opposing the delisting on the grounds of hazards to fish and wildlife. EPA said that it had conducted a review of this specific issue and concluded that there would be no harmful effects. Id. at 25,851/1.

Any concern that soluble salts could adversely affect fresh water ecosystems should be further diminished for two reasons. First, neutralized wastewater is often discharged into brackish surface waters which are unsuitable habitats for freshwater ecosystems. For example, the Houston Ship Channel into which we discharge has a TDS level of 12,000 mg/l, a chloride level of 6,500 mg/l, and a sulfate level of 900 mg/l. This is brackish water, equivalent to 34% seawater, and uninhabitable by freshwater ecosystems. Our discharge increases the sulfate concentration by less than 3%, which has no effect on this already brackish water.

Comment Number 3-B-18 (continued)

Docket Number LD12-00194.

Commenter Rohn and Haas

Issue D002- Characteristic ^{Corrosive} Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

The lack of impact is further supported by effluent biomonitoring which we have done quarterly for over five years at our Houston facility. This biomonitoring for acute effects of salinity and other parameters was done as part of Region VI's second-round permitting requirements. The results consistently show no impact from salinity in the discharge. See Permit No. TX0056529, Part III, Item 5.

Second, even if salinity of the surface waters is low, because the discharge is often a "drop in the bucket" there will almost always be no effect. For example, at our Bristol, Pennsylvania plant, we discharge into a portion of the Delaware River that has a salinity of about 25 ppm. Our discharge has a salinity of about 100 ppm. But the volume of the discharge is so small (about 2 ft.³ /sec.) as compared to the flow of the river (3000 ft.³ /sec) that there is less than a .07% change in the salinity of the river caused by our discharge.

In parts of the country where the salinity and volume of the surface water are extremely low it has been our experience that EPA or individual states will include salinity parameters in NPDES permits if the discharge could negatively impact water quality. EPA should continue to use its authority under the Clean Water Act to address directly these situations. EPA should not broadly prohibit all soluble salts from corrosive wastewater treatment when the problem, if it exists at all, is limited.

Comment Number 3-B-18 (continued)

Docket Number WD12-00194

Commenter Rohn and Haas

Issue D002 - Characteristic Corrosive Wastes

Subissue Proposed Insoluble Selt Requirement

Comment

Another major problem EPA has not fully considered is what will be done with the massive quantities of sludges that will result if insoluble salts must be formed. EPA says that neutralizing one gallon of concentrated sulfuric acid with lime to form insoluble salts results in 19 pounds of insoluble sludges. See 54 Fed. Reg. at 48,423/2. Based on the concentrations in the acid we neutralize at Houston and an average volume of 2,060,000 gpd, we expect to generate 220,000 wet tons of sludge a year, which is the equivalent of a 75 foot high pile on a football field.

About 80,000 wet tons per year of this sludge would contain organics. This organic sludge could not be recovered for gypsum or otherwise without cost-prohibitive treatment to remove the organics. All of this sludge would have to be disposed of in a nonhazardous waste landfill or waste pile, and we are not sure that this large capacity is available. The remaining 140,000 tons per year of the sludge which does not contain organics theoretically could be recovered for gypsum, if there are no other impurities. In reality, however, there is an inadequate recycling market today for even pure anhydride sludges.

Comment Number 3-B-18 (continued)

Docket Number WD12-00194

Commenter Rohm and Haas

Issue D002- Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

An even worse air emission problem arises if the sludges contain listed wastes or would fail the upcoming toxicity characteristic. These sludges could not even be stored in a waste pile until they are pretreated to the applicable land disposal restriction treatment standards. If the wastes are hazardous because they contain organics, this treatment most likely will entail incineration. Incineration of sulfate and nitrate sludges could result in very significant emissions of SO_2 and NO_x . Moreover, the need to incinerate these sludges would further stress the inadequate incineration capacity that exists today.

Additionally, to neutralize all the corrosive wastewater in the U.S., enormous quantities of lime or soda ash would have to be mined, or ferric and aluminum salts would have to be mined or manufactured. The mining and production of these chemicals is not without environmental problems, including resource depletion.

EPA should consider the comparative risks of the insoluble salt treatment standard it proposes. The sludge management complications, the air emissions from sludge incineration, the stress on incineration capacity, and the mining of neutralizing agents present significant problems which EPA should weigh against the negligible impact, if any, that sodium sulfate would have on freshwater ecosystems.

Comment Number

3-B-18 (continued)

Docket Number

LD12-00194

Commenter

Rohn and Haas

Issue

D002: Characteristic Corrosive Wastes

Subissue

Comment

There are numerous other practical problems that would result if we are forced to form insoluble salts. First, at Bristol and in one of our wastewater treatment systems in Houston, we neutralize corrosive wastewater to where it is nonhazardous waste and then place it in biological lagoons where bacteria destroy trace organics to meet our NPDES limits. If we start putting insoluble salts into the lagoon it will spoil the bacterial system. The precipitation of CaCO_3 in the basin cannot be tolerated since the inert fraction of the mixed liquor solids will increase with time due to accumulation and could result in the loss of biological activity. Thus, we could not use biological treatment without first filtering the wastewater to remove the insoluble salts. This filtration system would be very expensive and time consuming to install.

A second practical problem is that we do not have the storage capacity to handle the large amounts of sludges that would be generated if insoluble salts must be formed. We do not have the land area (equivalent to one or more football fields) near our waste management area to store the sludges. We suspect that most generators would not have such a large area of unused space.

Comment Number: 3-B-18 (continued)

Docket Number: LD12-00194

Commenter: Rohn and Haas

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirement

Comment:

In sum, even if money were no object, by May 8, 1990 we cannot change our neutralization, transportation and storage facilities to enable us to neutralize with lime, to handle the massive quantities of sludges we would generate, and to achieve the biological destruction of organics that we must achieve in some of our corrosive wastewaters to meet our NPDES limits.

For all of these reasons, EPA should allow formation of sodium sulfate. If there is a concern regarding discharges to a few freshwater ecosystems, which concern we question in light of the sodium sulfate delisting and our own biomonitoring results, EPA should address those discharges by imposing effluent limitations in NPDES permits. There is no need for an across-the-board prohibition on sodium sulfate, particularly in light of the problems that will result from the huge quantities of sludges that will be generated.

Comment Number 3-B-18 (continued)

Docket Number LD12-000194

Commenter Rohm and Haas

Issue 2002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

A less-preferred alternative to EPA allowing formation of sodium sulfate is to provide for generic exceptions. Specifically, EPA could require insoluble salts except when (1) the wastewater discharge would not measurably affect the salinity of the surface water because of the background surface water salinity and/or the relative volumes of the discharge to the surface water; and (2) where formation of insoluble salts would interfere with biological treatment.

EPA has authority to establish these generic exceptions and could apply them through permits, just as EPA proposes for injection of corrosive wastewaters into underground wells. See 54 Fed. Reg. at 48,423/1. By including these exceptions in the treatment standards, EPA can also avoid having to process numerous treatability variances, by May 8, 1990, for the many facilities that treat corrosive wastes and form soluble salts.

COMMENT NUMBER: 3-B-18
DOCKET NUMBER: LD12-00194
COMMENTER: Rohm and Haas
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The insoluble salt requirement for D002 acidic and alkaline wastes was initially proposed because the Agency prefers the neutralization of D002 waste such that relatively nontoxic solid wastes are precipitated out of solution rather than discharging wastes with high dissolved solid contents. The Agency believes that discharges with high dissolved solids such as sodium sulfate could enhance algal growth and potentially have adverse impacts on fresh water ecosystems. Although the impact may not be significant, the Agency still believes that this is a legitimate concern.

EPA received many comments against the proposed insoluble salt requirement. Many of these commenters, such as this one, indicated that soluble salts should not be regulated as part of the land disposal restrictions because discharges to freshwater ecosystems from wastewater treatment facilities are currently regulated by either NPDES or POTW permits. Also, the Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some D002 wastes such as nitric acid, hydrochloric acid, and other acid halides. This commenter also notes that the formation of insoluble salts would disrupt the onsite biological treatment process by inhibiting biological oxidation.

The Agency agrees with the points described above that were made by this and other commenters. Based on this, the Agency has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency

COMMENT NUMBER: 3-B-18 (continued)
DOCKET NUMBER: LD12-00194
COMMENTER: Rohm and Haas
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

believes that individual facility discharge limits are sufficient to control releases of soluble compounds such as sodium sulfate into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

...
Comment Number: 3-B-19

Docket Number: LD12-00196

Commenter: SCM Chemicals, Inc.

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirement

Comment:

The associated requirement for insoluble salts is absurd. Dissolved salts in neutralized solutions, such as sodium sulfate or sodium chloride, are natural in fresh as well as in estuarine or marine waters and seldom pose any hazard. Also, some mineral acids such as nitric acid form no essentially insoluble nitrate salts. Similarly, hydrochloric acid forms typically soluble chloride salts, excepting silver chloride and perhaps a few other exotic metal salts (e.g., mercurous chloride). Surely, EPA is not proposing to require that a silver compound be used as the neutralizing agent for hydrochloric acid wastewaters.

In all events, there appears to be nothing in the docketed evidentiary materials or elsewhere that shows the NPDES regulatory system to be deficient. A more stringent, superseding RCRA regulation under Section 3004(m) has no justification.

COMMENT NUMBER: 3-B-19
DOCKET NUMBER: LD12-00196
COMMENTER: SCM Chemicals, Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

EPA received many comments against the proposed insoluble salt requirement. Many of these commenters, such as this one, indicated that soluble salts should not be regulated as part of the land disposal restrictions because discharges to freshwater ecosystems from wastewater treatment facilities are currently regulated by either NPDES or POTW permits. Also, the Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some D002 wastes such as nitric acid, hydrochloric acid, and other acid halides. As noted by this commenter, there are no essentially insoluble nitrate salts and a requirement to form silver chloride would be impractical and may actually be the formation of a hazardous waste.

The Agency agrees with the points describe above that were made by this and other commenters. Based on this, the Agency has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits are sufficient to control releases of soluble compounds such as sodium sulfate into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 acidic and alkaline wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

The Agency also received many comments on the definition of "insoluble salt." Due to the various degrees of solubility of salts, the

COMMENT NUMBER: 3-B-19 (continued)
DOCKET NUMBER: LD12-00196
COMMENTER: SCM Chemicals, Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

Agency believes that the term "insoluble" cannot be positively defined; therefore, this definition would be open to interpretation and likely cause confusion.

Consent Number 3-B-20

Docket Number LD12-00198

Consent Department of Energy

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Consent

DOE disagrees with the proposed treatment standard for acids and alkalines, "Neutralization to pH 6 - 9 and Insoluble Salts." The formation of insoluble salts is certainly desirable, however, it is not always practical or even possible to form insoluble salts during neutralization of some corrosives like nitric acid, or sodium or potassium hydroxide. In a review of over 50 fifty inorganic nitrate compounds, it was found that there is only one insoluble nitrate salt that can form, bismuth subnitrate, and this compound can probably only be formed in the laboratory. Likewise, there are no common insoluble sodium or potassium salts for neutralizing the common sodium or potassium hydroxide bases. Some insoluble salts are toxic (chromates) or are exotic, as previously described (bismuthates, tungstates). Also, the lack of a definition for insoluble (e.g., grams per liter) adds to the difficulty of compliance with this proposal.

Since insoluble salts cannot be formed in many cases, the treatment standard cannot be applied. This infers that substitute raw chemicals must be found within industry. When you review the abundance of nitric acid and sodium and potassium hydroxide that is used in industry, it can be concluded that this is not a viable option. As an alternative, EPA might consider requiring the formation of an insoluble salt only for cations (e.g., Ba, Ca) or anions (e.g., SO₄, PO₄) that are conducive to forming an insoluble salt.

COMMENT NUMBER: 3-B-20
DOCKET NUMBER: LD12-00198
COMMENTER: Department of Energy
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency acknowledges and agrees with the points made by the commenter that the formation of insoluble salts is either impractical or impossible for some D002 wastes such as nitric acid and hydrochloric acid or sodium or potassium hydroxide. The Agency agrees that for certain waste streams, toxic salts containing heavy metals would have to be formed in order to comply with the insoluble salt requirement. The Agency also received many comments on the definition of "insoluble salt." Due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined, therefore this definition would be open to interpretation and likely cause confusion.

The Agency has therefore, reconsidered the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number 3-B-21

Docket Number LD12-00204

Commenter Util SW Act. Group / Util Nuclear Waste & Transp, EEI

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comments

The Electric Utilities also strongly oppose the second component of EPA's proposed treatment standard for the D002 acid and alkaline subcategory; namely, the requirement for "insoluble salts." 54 Fed. Reg. at 48422. This proposed requirement will needlessly eliminate an environmentally sound and efficient treatment practice for certain utility waste streams. Specifically, a common utility practice for handling corrosive waste streams from the boiler water demineralizer system is to combine the acid waste stream and the alkaline waste stream prior to discharge through a facility's wastewater treatment system. This practice could be prohibited under EPA's proposal due to the concern for discharge of soluble salts. The Electric Utilities believe EPA's concern is over-stated, and, in those instances where a concern does exist, should be addressed on a site-specific basis by regional or state water quality offices, not under RCRA's land ban program.

As a preliminary point, however, the Electric Utilities challenge EPA's authority to set land ban treatment standards for discharges into surface waters. Since this type of management option is regulated under applicable federal and state water laws -- and is not land disposal -- the Agency has no jurisdiction to impose an "insoluble salt" standard under the land ban program for treatment practices involving surface water discharges.

~~Comment Number~~ 3-B-21 (continued)

~~Docket Number~~ LD12-00204

~~Comment~~ Util SW Act. Group/ Util Nuclear Waste & Transp., EEI

~~Issue~~ D002: Characteristic Corrosive Wastes

~~Subissue~~ Proposed Insoluble Salt Requirement

~~Comment~~

In any event, EPA's alleged concern over the potential impact of soluble salts on fresh water ecosystems from neutralization activities is extremely speculative and site-specific, and certainly does not warrant an across-the-board requirement that all treatment operations result in insoluble salts. Many utilities would have to incur substantial costs and undergo significant operational changes to ensure compliance with an "insoluble salt" standard with little or no corresponding incremental environmental benefit. This point is compounded by the fact that there is nothing that indicates that the discharge of sodium sulfate from utility power plants has a significant water quality impact, especially with the amount of neutralization and dilution occurring in a power plant discharge.

Further, in those instances where the discharge of soluble salts may have a water quality impact, the appropriate vehicle for addressing the concern is under a facility's NPDES permit or pretreatment requirements. Because such concerns are site-specific, it is far preferable to address these matters on a case-by-case basis working with regional or state water quality regulatory authorities, rather than imposing an unduly restrictive requirement on the entire regulated community under the RCRA land ban program. Further, in many instances, meeting the "insoluble salt" standard will require the use of additional treatment chemicals, thus increasing -- rather than decreasing -- the volume of wastes.

COMMENT NUMBER: 3-B-21
DOCKET NUMBER: LD12-00204
COMMENTER: Util SW Act. Group/Util Nuclear Waste and Transp., EEI
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency agrees with the Commenter that the insoluble salt requirement could negate using alkaline and acidic waste streams generated onsite to co-neutralize each other. The Agency believes that co-neutralization such as in line neutralization is a sensible and beneficial management practice and therefore should not be restricted by an insoluble salt requirement.

The Agency also believes that existing regulations such as NPDES and POTW permits are sufficient to control discharges of soluble salts into freshwater ecosystem. The Agency, therefore, has reconsidered the "insoluble salt" requirement. The agency believes that individual facility discharge limits will control releases of soluble compounds into one environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

~~Consent Number~~ 3-B-22

~~Docket Number~~ LD12-00216

~~Consent~~ BP Chemicals

~~Issue~~ D002: Characteristic Corrosive Wastes

~~Subissue~~ Proposed Insoluble Salt Requirement

~~Consent~~

The BDAT standard proposed for neutralization of wastes that will be injected creates unnecessary additional wastes while affecting the mobility of injected wastes and providing no additional protection for the environment. This is because removing salt prior to deepwell injection will decrease density of the wastewater which can affect the long term drift and likelihood of waste movement. If insoluble salts are formed, the sludge generated will consume valuable landfill capacity and potentially accelerate mobility of other wastes in the landfill.

COMMENT NUMBER: 3-B-22
DOCKET NUMBER: LD12-00216
COMMENTER: BP Chemicals
ISSUE: D002-Characteristic corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received several comments, including this one, indicating that the proposed insoluble salt requirement would prevent optimum operations at underground injection wells. The Agency proposed the insoluble salt requirement in order to protect fresh water ecosystems. However, this is not applicable to underground injection wells because they do not have discharges to fresh water ecosystems. The Agency also agrees that the limited landfill space would be affected by the generation of sludges due to the insoluble salt requirement.

Based on information received from commenters, the Agency has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility permits (such as NPDES, POTW, and UIC permits) are sufficient to control releases of soluble compounds into the environment as a result of the treatment of all D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 wastes. The Agency has established this standard to allow the regulated community the flexibility to use the best technology for each specific D002 waste stream. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

COMMENT NUMBER: 3-B-22
DOCKET NUMBER: LD12-00216
COMMENTER: BP Chemicals
ISSUE: D002-Characteristic corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received several comments, including this one, indicating that the proposed insoluble salt requirement would prevent optimum operations at underground injection wells. The Agency proposed the insoluble salt requirement in order to protect fresh water ecosystems. However, this is not applicable to underground injection wells because they do not have discharges to fresh water ecosystems. The Agency also agrees that the limited landfill space would be affected by the generation of sludges due to the insoluble salt requirement.

Based on information received from commenters, the Agency has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility permits (such as NPDES, POTW, and UIC permits) are sufficient to control releases of soluble compounds into the environment as a result of the treatment of all D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 wastes. The Agency has established this standard to allow the regulated community the flexibility to use the best technology for each specific D002 waste stream. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

....
Comment Number 3-B- 23

Docket Number LD12-00224.

Commenter Texaco

Issue D002: Characteristic Corrosive Wastes

Subject Proposed Insoluble Salt Requirement

Comments

Corrosive Wastes - Neutralization to Insoluble Salts

The neutralization of acid and alkaline wastes to insoluble salts is not necessary to minimize threats to human health and the environment. EPA has not demonstrated that the soluble salts produced through the neutralization of acid and alkaline wastes have any adverse effect on any fresh water ecosystems. If there are such cases, the discharges of these salts can be regulated under the Clean Water Act & NPDES permit program possibly using the national secondary drinking water standards for sulfate and dissolved solids as receiving water standards where applicable. The reported quantities of sodium sulfate under SARA were almost exclusively discharges to water rather than to land; in addition sodium sulfate has been taken off the Toxic Release Inventory list due to its lack of toxicity. This portion of the proposed rule has no demonstrated benefit, would be costly for generators to comply with, and would generate additional solid waste which is already a growing crisis in this country.

COMMENT NUMBER: 3-B-23
DOCKET NUMBER: LD12-00224
COMMENTER: Texaco
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

EPA is not finalizing the insoluble salt requirement.

Comment Number 3.B-24

Docket Number LD12-00242

Commenter Amoco Corporation

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

In addition, more narrow restrictions would exceed EPA's authority, as discussed later in more detail. The requirement for neutralization products to be insoluble salts is not reasonable, as it would counter the Agency's waste minimization objectives. Neutralization of an acidic waste stream with lime, for example, would result in a large amount of sludge. Some organic constituents (which are present in small quantities in some spent acids) would remain in the sludge, rather than be biodegraded in the facility's centralized wastewater treatment plant. The sludge would be sent for disposal as a nonhazardous waste.

Part of the Agency's rationale for requiring insoluble salts is concern for the amount of sodium sulfate entering surface waters. According to the Toxic Release Inventory (TRI), more sodium sulfate is discharged to surface water than any other reported chemical. However, because sodium sulfate presents such a low risk, it has recently been deleted from the TRI reporting system. EPA's concerns about sodium sulfate in this proposal appear unjustified.

COMMENT NUMBER: 3-B-24
DOCKET NUMBER: LD12-00240
COMMENTS: Amoco Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency acknowledges and agrees with this point. When the Agency proposed the insoluble salt requirement, they did not intend to interfere with the optimum treatment of a waste stream, such as the treatment of organic constituents.

Therefore the Agency has reconsidered and is not promulgating the "insoluble salt" requirement. EPA believes that individual facility discharge limits are sufficient to control releases of soluble compounds such as sodium sulfate into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Consent Number 3.B-25

Docket Number LD12-00242

Corrosive Merck & Co., Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

In establishing the treatment standards for D002-Corrosive wastes - neutralization to pH 6-9 with insoluble salts - once again we feel that the treatment standard should be at the characteristic levels. We feel that the Agency is creating an even greater disposal problem from the insoluble salts. Many corrosive wastes would be discharged to a river, on-site treatment plant, or local POTW.

COMMENT NUMBER: 3-B-25
DOCKET NUMBER: LD12-00242
COMMENTER: Merck and Co. Inc.
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received many comments which stated that the insoluble salt requirement was unnecessary because discharges of soluble salts are already requested by NPDES and POTW permits. The Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some common D002 wastes such as nitric acid and hydrochloric acid. Additionally, due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined. Therefore, this definition would be open to interpretation and likely cause confusion.

EPA agrees with the comments described above; and therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits are sufficient to control releases of soluble compounds into the environment from the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Conservation Number 3-B-26

Docket Number LD12-00243.

Conservation NCASI

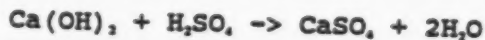
Issue D002: Characteristic Corrosive Wastes

Subject Proposed Insoluble Salt Requirement

Comments

- (3) Neutralization of characteristic corrosive wastes to insoluble salts is not always feasible, may not be desirable in many instances, and should not, therefore, be required.

The preamble presents the example of sulfuric acid neutralization with lime to precipitate calcium sulfate.



A similar example could have been presented using phosphoric acid. Likewise, an insoluble salt could be obtained by carbonating a calcium hydroxide solution.



Undoubtedly, there are other pH - corrosive wastes that could be neutralized to insoluble salts. However, there are some other examples for which this treatment standard presents major difficulties. Table 2 helps to illustrate the problem by showing the solubility of common salts and the following "Rules of Solubility" provide more general guidance on the subject.

Table 2 Water Solubilities of Salts and the Rules of Solubility

TABLE OF SOLUBILITIES

S, soluble in water. A, soluble in acids, insoluble in water. P, partially soluble in water, soluble in dilute acids. I, insoluble in dilute acids and in water. a, slightly soluble in acids, insoluble in water. d, decomposes in water.

	ACETATE	BORATE	CARBOXYLATE	CHLORATE	CHLORIDE	CYANIDE	FLUORIDE	FORMATE	HYDROGEN	HYDROXIDE	NITRATE	OXIDE	PERMANGANATE	SILICATE	SULFATE	SULFIDE	SULFONATE
Aluminum	S	S	S	S	S	S	A	S	S	S	S	S	A	S	S	S	d
Ammonium	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Barium	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Bismuth	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Cadmium	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Copper	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Ferrous	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Lead	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Magnesium	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Manganese	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Mercurous	P	A	A	S	S	P	A	S	S	S	S	S	S	S	S	S	S
Mercuric	S	S	S	S	S	P	A	S	S	S	S	S	S	S	S	S	S
Potassium	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Silver	P	A	A	S	S	P	A	S	S	S	S	S	S	S	S	S	S
Sodium	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Stannous	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Stannic	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Strontium	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Zinc	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S

RULES OF SOLUBILITY

1. Common sodium, potassium, and ammonium compounds are soluble in water.
2. Common nitrates, acetates, and chlorates are soluble.
3. Common chlorides are soluble except silver, mercurous, and lead. (Lead chloride is soluble in hot water.)
4. Common sulfates are soluble except calcium, barium, strontium, and lead.
5. Common carbonates, phosphates, and silicates are insoluble except sodium, potassium, and ammonium.
6. Common oxides are insoluble except sodium, barium, strontium, magnesium, sodium, potassium, and ammonium.

from CHEMISTRY PROBLEMS, J.F.Castka; Holt, Rinehart, and Winston; New York, 1962

... Comment Number 3-B-26 (cont.)

Docket Number LD 12-00243.

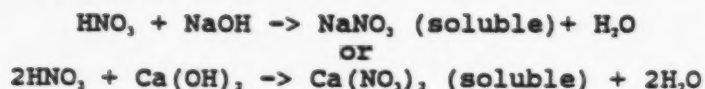
Comment NCASI

Issue D002: Characteristic Corrosive Wastes

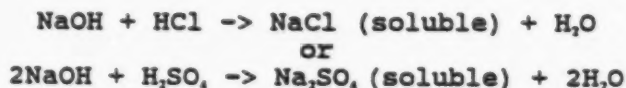
Subject Proposed Insoluble Salt Requirement

Comment

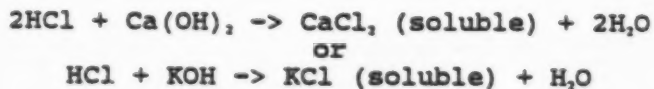
From the table, it can be seen that nitric acid cannot be neutralized to insoluble salts because no common nitrate salts are insoluble. The following examples illustrate this problem.



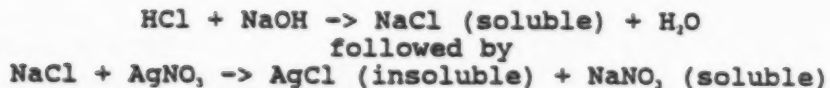
Similarly, it is not clear how sodium or potassium hydroxide solutions could be neutralized to insoluble salts since all common ionic salts of those metals are water soluble. For example,



The situation is somewhat different for hydrochloric acid (and other acid halides except HF). It is possible to form insoluble halogen salts, but as shown by the table, they all require the use of heavy metals. Furthermore, the reactions used in this process are likely to involve neutralization then precipitation, generating in the process, additional soluble salts (albeit not halide salts). The following examples illustrate the problem.



but



Neutralization to insoluble salts would, in this case, require the purchase, transport, and handling of large amounts of heavy metals, such as mercury or silver. It would result in the creation of massive quantities of heavy metal sludges, most of which would probably be hazardous themselves. Certainly none of these sludges would be considered the "relatively nontoxic solid wastes" the agency envisions being formed (FR 54 48423), yet to meet the letter of the proposed rules it would be necessary to generate them.

Comment Number 3-B-26. (continued)

Docket Number LD12-00243.

Comments NASI

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comments

Even ignoring the high cost of heavy metal precipitation of halides, it is difficult to understand how conversion of aqueous pH - corrosive wastes to hazardous heavy metal sludges can be considered the best demonstrated available treatment technology to protect human health and the environment from hazardous wastes.

Even when "relatively nontoxic solid wastes" (apparently including calcium sulfate and calcium carbonate) can be formed during neutralization, it is not clear why this would always be the preferred option. For example, facilities in the Northeast with ocean discharges would likely create no environmental problems by discharging dissolved sodium sulfate (a major component of sea water), but they might create major problems if they tried to dispose of large quantities of calcium sulfate sludge in the limited landfill space available. Even if a facility discharges to a fresh receiving water, it is not difficult to envision instances where the potential for environmental harm is greater from sludge disposal than from discharge of dissolved solids.

We would also point out that in the case of sodium sulfate, a ubiquitous chemical and one of the most common soluble reaction products from neutralization processes, the chemical has been removed from the SARA Section 313 reporting requirements because of its relative lack of toxicity. The other most common soluble reaction product, sodium chloride, is likewise ubiquitous and relatively nontoxic.

Comment Number 3-13-26 (continued)

Docket Number LD 12- 00243

Commenter NCASI

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

Moreover, it is unclear why these rules focus on protection of fresh water ecosystems as a goal. We wholeheartedly agree that protection of that resource is important. However, programs already in place under the Clean Water Act (e.g. NPDES Permit Program, Water Quality Standards) are designed to prohibit discharges that could harm that resource. This would include discharges from any neutralization scheme that might be used to treat pH - corrosive hazardous wastes. These programs allow the characteristics of the receiving water to be considered in determining appropriate discharge limits.

Given (a) the arguable and site-specific nature of the toxicity of the soluble salts formed in common neutralization reactions, and (b) the ubiquity of these salts, EPA should allow concerns about the discharge of these materials to be dealt with under laws and regulations better suited to the task (i.e. Clean Water Act regulations). The treatment standards for RCRA corrosive wastes should be based on those technologies that are appropriate, demonstrated, and available for rendering such wastes nonhazardous. The NPDES program is appropriate and adequate to the task of ensuring that discharges of soluble salts generated in neutralization processes will not cause unacceptable impacts to receiving waters.

COMMENT NUMBER: 3-B-26
DOCKET NUMBER: LD12-00243
COMMENTER: NCASI
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency acknowledges and agrees with the points made by the commenter that the formation of insoluble salts is either impractical or impossible for some D002 wastes such as nitric acid, sodium hydroxide, potassium hydroxide, hydrochloric acid, and other acid halides. The Agency agrees that for certain waste streams, toxic salts containing heavy metals would have to be formed in order to comply with the insoluble salt requirement. The Agency also received many comments on the definition of "insoluble salt." Due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined. Therefore this definition would be open to interpretation and likely cause confusion.

Many commenters pointed out that effluent discharges are currently regulated by either NPDES or POTW permits. The Agency agrees with those points; and therefore, has reconsidered the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number 3-B-27

Docket Number LD12-L0005

Comment KODAK

Issue: D002: Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirement

Comment

D002 CORROSIVE WASTES

Neutralization to Insoluble Salts Is Practically Impossible for Many Corrosive Materials.

The words "insoluble salts" should be removed from specific technologies of both the D002 alkaline and acid subcategories.

While transforming the corrosive material to an insoluble, neutral solid for disposal may sound attractive, it is virtually impossible for many corrosive materials and impractical for most of the rest. Many inorganic salts are quite soluble and most have significant solubility. Even the Agency discussion of the preference of calcium sulfate over sodium sulfate is an example of this situation. Calcium sulfate cannot be said to be insoluble as it has solubility of 0.2 parts per 100 parts of water. No example of an insoluble neutralization product of nitric acid can be given because there is no common and cheap neutralization agent which forms an insoluble salt with nitric acid.

Salts are common in the environment and life forms tend to be tolerant of relatively high concentrations of many of them. The most common relatively insoluble salt of hydrochloric acid is silver chloride which is both very expensive and would be considered toxic. The neutralization of bases is similar with no common insoluble salts of sodium or potassium. The Agency should not require impossible, highly impractical, or even toxic materials to be used to neutralize corrosive materials, when soluble neutralization products may be generated which may be protective of human health and the environment. Also, it is not certain that the soluble salts which are currently permitted for discharge with dilution into the waters of the nation are more harmful than slightly soluble salts stored in landfills.

COMMENT NUMBER: 3-B-27
DOCKET NUMBER: LD12-L0005
COMMENTER: KODAK
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency acknowledges and agrees with the points made by the commenter that the formation of insoluble salts is either impractical or impossible for some D002 wastes such as nitric acid, sodium hydroxide, potassium hydroxide, hydrochloric acid and other acid halides. The Agency agrees that for certain waste streams, toxic salts containing heavy metals would have to be formed in order to comply with the insoluble salt requirement. The Agency also received many comments on the definition of "insoluble salt." Due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined. Therefore, this definition would be open to interpretation and likely cause confusion.

The Agency, therefore, has reconsidered and is not promulgating "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number 3-B-28

Docket Number LD12-00197

Commenter Sterling Chemical

Issue D002 - Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

The Agency suggests using lime or other precipitating neutralization agents for soluble salt control. At the same time, under another program, SARA Title III, the Agency has "delisted" the neutralization salt sodium sulfate from status as a hazardous material requiring annual release reporting. It appears incongruous that the Agency is issuing this proposal to require soluble salt control under RCRA while virtually simultaneously it removes the stigma of soluble salt release reporting under another program.

Sterling Chemicals again would suggest that legitimate water quality concerns are better served by the Clean Water Act programs which have been in place for over fifteen years. Technology-based and water quality-based effluent limitations are already in place and are protective of the environment. Control of neutralization salts under RCRA is needlessly overprotective, and, moreover, conflicts with the aims of the Clean Water Act.

The Agency has also failed to adequately consider the effect of neutralization precipitate on land disposal capacity. Even if we accept the premise that there is benefit to surface water quality, we must balance this benefit against the effect of surface disposal of neutralization precipitates. The most common of these precipitates would be calcium sulfate, or gypsum. Rather than the recyclable material which the Agency has described, such by-product gypsum is more likely to be contaminated with trace organics which would have otherwise been removed in advanced steps. Such contaminated gypsum is simply a candidate for landfill or piles. This proposal is contrary to the directives to abandon surface disposal.

COMMENT NUMBER: 3-B-28
DOCKET NUMBER: LD12-00197
COMMENTER: Sterling chemical
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received numerous comments concerning the proposed insoluble salt requirement for D002 acidic and alkaline wastes. Several commenters such as this one, indicated that the discharge of soluble salts is already being regulated through NPDES and POTW permits and that the insoluble salt requirement would result in the formation of large volumes of sludge that would need to be landfilled. The commenters believed that insoluble salt sludges would unnecessarily take up limited landfill space. This commenter also notes that the proposed insoluble salt requirement would prevent optimum treatment of certain waste streams such as D002 wastes that also contain organics. Other commenters pointed out that the formation of insoluble salts is either impractical or impossible for some D002 wastes such as organic acids, nitric acid, sodium hydroxide, potassium hydroxide, hydrochloric acid, and other acid halides.

EPA agrees with these comments; and therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits are sufficient to control releases of soluble compounds such as sodium sulfate into the environment as a result of the treatment of D002 acidic and alkaline wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number 3-B-29

Docket Number LD12-L0007.

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

I. The Proposed Treatment Standards for D002 Acid and Alkaline Wastes Are Environmentally Unnecessary and Technically Infeasible.

EPA has proposed treatment standards for D002 acid and alkaline wastes that require neutralization to a pH of 6 to 9 using agents that form insoluble salts. 54 Fed. Reg. at 48,422. The Agency's rationale for these proposed standards include: (1) hydronium ions may solubilize metals from clay liners; (2) hazardous constituents in ground waters may be mobilized by pH values below 6 or above 9; (3) this pH range matches the buffering capacity of natural systems; (4) and soluble salts, if improperly managed, could adversely impact fresh water systems. As will be discussed in the following subsection and again in Section XVI with respect to injected wastes, EPA has not conducted a thorough technical analysis of its assumptions, and its proposed standards for D002 alkaline and acid wastes are not only technically infeasible for some wastes, but also may cause adverse environmental impacts.

Comment Number 3-B-29 (continued)

Docket Number LD12-L0007.

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

4. EPA's Proposal To Require the Generation of Insoluble Salts Is Without Merit.

EPA's arguments to support its proposed requirement that neutralization yield insoluble precipitates are also unsupportable. First, EPA cites the "fact" that dissolved salts may adversely impact fresh water ecosystems.^{6/} CMA agrees with this statement; this is one reason why every discharge to surface waters must be permitted under the CWA. When the Agency permits a discharge, it explicitly evaluates every significant constituent in the wastewater discharge, including dissolved salts. There are water quality standards under the Clean Water Act for dissolved salts in fresh waters, and the Agency's (or states') permit writers must assure that these are satisfied and that aquatic ecosystems are protected before a permit is issued. Soluble salts formed by most neutralization are naturally-occurring, for example, sea water contains about 5000 mg/l of sodium sulfate. In addition, most fresh water aquatic life forms are not particularly sensitive to salts, concentrations of total dissolved solids (salts) as great as 1,500 mg/l are typically acceptable. The most restrictive standards are those for drinking water; and the states and EPA have historically required permit limits that assure that such standards are achieved.

^{6/} CMA is puzzled by the relevance of this criterion as applied to wastewaters. Such wastewaters destined for surface water discharge are not subject to 40 C.F.R. Part 268 since they are not being land disposed.

Comment Number: 3 B-29 (Continued)

Docket Number: LD18-L0007

Comment: CMA

Issue: D002: Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirement

Comment:

The Agency makes an issue of the fact that sodium sulfate is the chemical discharged in the largest amounts to surface water, according to the Agency's Toxic Release Inventory. This "fact" is a straw man. The Agency has already removed sodium sulfate from its future inventories. 54 Fed. Reg. 25,850 (June 20, 1989). There is ample justification for this because sodium sulfate is not only the second most-common naturally-occurring salt in fresh water (Figure 8-1, Stumm, W. and Morgan, J.J., 1970, Aquatic Chemistry, Wiley-Interscience, New York), but also less toxic than common table salt, sodium chloride. However, where necessary, sodium sulfate is controlled through a facility NPDES permit to comply with water quality standards and protect aquatic ecosystems. The mouse oral LD50 for sodium sulfate is 5989 milligrams per kilogram of body weight (mg/kg-bw); the corresponding LD50 for sodium chloride is 4000 mg/kg-bw (Sax, N.I., 1984, Dangerous Properties of Industrial Materials, 6th edition, Van Nostrand Reinhold Company, New York).

EPA also cites concern over soluble nitrates as a reason for its proposal. Apparently, the Agency is unaware of the fact that there are no essentially insoluble nitrate salts (see Stumm and Morgan, op.cit.). If there were, nitrogen removal from wastewater effluents would be a practical and cost-effective treatment technology.

Comment Number 3-B-29 (continued)

Docket Number LD12-2007

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comments

Phosphates are also cited as a chemical that should be removed from effluents to prevent nutrient enrichment of fresh waters. Again, the NPDES permitting program already requires such removals, when necessary, to protect fresh water ecosystems.

...Chlorides resulting from the use of hydrochloric acid present another technological feasibility problem. The only moderately insoluble chloride salt is silver chloride; but silver itself is EP toxic above 5.0 mg/l. Besides being uneconomical, using silver as a neutralizing agent could create a new hazardous solid waste due to silver's EP toxicity characteristic.

Comment Number 3-B-29 (continued)

Docket Number LD12-L0007.

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comments

Removing sulfate as a precipitate during neutralization also presents a technological dilemma. The most insoluble sulfate salt is barium sulfate; calcium sulfate is more than twice as soluble in water (Stumm and Morgan, op. cit.). If EPA's proposed neutralization standard is taken to its logical conclusion, then barium salts should be used to react with acidic wastes containing sulfates. However, not only is barium hydroxide much more costly than calcium hydroxide, but barium is a hazardous constituent if present in an EP leachate (D005, 40 C.F.R. § 261). Although barium would probably not leach at concentrations above the EP toxicity level of 100 mg/l from most precipitates formed by this neutralization reaction, it is not a reasonable environmental trade-off to use a hazardous constituent to remove a nonhazardous constituent and concentrate it in a solid, even if the resulting solid is nonhazardous.

Moreover, insoluble salts will require land disposal. EPA's proposal would thus result in removing dilute wastes from wastewaters that normally would have been discharged to receiving waters in compliance with applicable NPDES permit conditions or injection in compliance with a UIC permit, and placing such wastes on the land, where the potential for environmental harm is greater.

COMMENT NUMBER: 3-B-29
DOCKET NUMBER: LD12-L0007
COMMENTER: CMA
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

EPA received many comments against the proposed insoluble salt requirement. Many of these commenters, such as this one, indicated that soluble salts should not be regulated as part of the land disposal restrictions because discharges to freshwater ecosystems from wastewater treatment facilities are currently regulated by either NPDES or POTW permits. The Agency also received many comments indicating that the formation of insoluble salts is either impractical or impossible for some D002 wastes such as nitric acid, hydrochloric acid, and other acid halides. As noted by this commenter, there are no essentially insoluble nitrate salts and a requirement to form silver chloride would be impractical and actually may be the formation of a hazardous waste. Additionally, the Agency received several comments on the definition of "insoluble salt." Due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined. Therefore, this definition would be open to interpretation and likely cause confusion.

The Agency agrees with the points describe above that were made by this and other commenters. Based on this, the Agency has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds such as sodium sulfate into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 acidic and alkaline wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number 3-B-30

Docket Number LD12-00267.

Commenter Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subject Proposed Insoluble Salt Requirement

Comments

A. The Proposed Requirement that Insoluble Salts be Generated as the Product of Neutralization is Unwise and in Many Cases Technologically Impossible

1. EPA Has Failed to Demonstrate Any Environmental Benefit From Requiring The Generation of Insoluble Salts

EPA's rationale for requiring generation of an insoluble salt⁹ as a product of neutralization seems to be the potential for adverse impacts of the soluble salts on water quality. EPA notes that neutralization of one gallon of sulfuric acid with caustic would lead to the generation of 22 pounds of sodium sulfate, which would most likely be released into the waters as a soluble salt, while the neutralization of the same quantity of sulfuric acid with lime would generate 19 pounds of "relatively insoluble, nontoxic sludge," which would most likely be land disposed. 54 *Fed. Reg.* 48423. The preamble goes on to note that "[i]n fact, data from the Toxic Release Inventory (TRI) indicates that sodium sulfate is the chemical being discharged in largest volumes to surface water." *Id.* "Therefore," EPA prefers that D002 wastes be neutralized such that solid wastes be generated rather than "wastewater discharges with high dissolved solid contents that could potentially have adverse impacts on fresh water ecosystems." *Id.*

⁹ The term "insoluble" is not defined in the proposed rules, and its meaning is not discussed in the preamble. Since virtually every salt is soluble to some degree, and since the range of solubilities is very broad, EPA must define what it means by "insoluble." Without such a definition, the requirement is impermissibly vague and subject to inconsistent application and enforcement. As discussed later in this section, calcium sulfate (the only "insoluble" salt to which EPA refers) is itself substantially soluble.

Consent Number

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Consent

Issue

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Consent

3-B - 30 (continued)

LD12 - 00267

Allied Signal, Inc.

D002: Characteristic Corrosive Wastes

Proposed Insoluble Salt Requirement

There is simply no need for a blanket prohibition on the generation of soluble salts in neutralizations carried out under the land ban regulations. First, although it is true that in some cases, the discharge of soluble salts (primarily sodium sulfate) could have an adverse impact on water quality, generally it has no such impact. Sodium sulfate is a naturally occurring salt; in fact, it is the second most prevalent salt in sea water.

EPA has recognized that the discharge of sodium sulfate does not present a significant health hazard. On June 20, 1989, the Agency deleted sodium sulfate from the list of toxic chemicals required to be reported under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). In deleting sodium sulfate from the reporting requirements, EPA stated:

It is EPA's determination that available data do not demonstrate that [sodium sulfate] causes or can reasonably be anticipated to cause significant adverse health or environmental effects. . . . EPA found no evidence of significant toxicity of [sodium sulfate] and does not feel the chemical presents a significant threat to the environment or the sewage treatment process.

54 Fed. Reg. 25850-51 (June 20, 1989).

Comment Number 3-B-30 (continued)

Docket Number LD12 - 00267

Commenter Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue - Proposed Insoluble Salt Requirement

Comment

Furthermore, any potential adverse impact of soluble salts on the water quality of the receiving waters is already handled under the Clean Water Act. Because the impact of sodium sulfate on a particular aquatic ecosystem depends on characteristics of the effluent and the ecosystem, evaluation of acceptable release concentrations must be done on a case-by-case basis. In cases where there could be an adverse impact, the NPDES permit issued by EPA or an approved state agency protects the receiving waters by limiting the mass of sodium sulfate discharged based upon considerations of either effluent limitations guidelines, water quality standards and criteria, the permit writer's best professional judgment, or more stringent state standards. The proposal to deal with this issue in the guise of land treatment requirements constitutes a totally unwarranted usurpation of the role of those EPA officials charged with the responsibility to administer the Clean Water Act and - substantially more troubling - a usurpation of the role of the States as the primary protectors of surface water quality under the Clean Water Act.

~~Comment Number~~ 3B-30 (continued)

~~Docket Number~~ LD12-00267

~~Commenter~~ Allied Signal, Inc.

~~Issue~~ D002: Characteristic Corrosive Wastes

~~Subissue~~ - Proposed Insoluble Salt Requirement

~~Comment~~

EPA has made no showing that there is any environmental benefit to be gained from the generation of a sludge that ordinarily must be land disposed, in preference to the generation of a soluble salt that is discharged into the waters. The closest EPA comes to a justification for this requirement seems to be the assertion that a smaller mass of salt is generated by neutralization using lime. However, this assertion is of extremely dubious relevance. Although mass is a critical characteristic of solid waste, ionic mass is practically irrelevant with respect to water quality. Moreover, the weight comparison seems suspect on its face,^{*} and it does not seem to take into account the fact that lime often contains a relatively high level of impurities in comparison to sodium hydroxide. More fundamentally, it is at least odd (and somewhat ironic) that EPA would require the generation of a solid waste that ordinarily must be disposed of on the land under the authority of a statutory provision designed to minimize the land disposal of wastes.

^{*} The molecular weight of calcium sulfate is approximately 96% of that of sodium sulfate, but the difference in the weights of the salts claimed by EPA to be generated would imply that calcium sulfate is only 85% of the weight of sodium sulfate. Moreover, the weight comparison ignores the fact that a substantial mass of water will be locked up in the calcium sulfate itself (calcium sulfate can form a hydrate) and in the sludge, further increasing the mass of the waste. Fully hydrated gypsum waste ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) would weigh approximately 121% the weight of sodium sulfate generated by neutralizing with sodium hydroxide.

~~Comment Number~~ 3-B-30 (continued)

~~Docket Number~~ LD12 - D0267

~~Comment~~ Allied Signal, Inc.

~~Issue~~ D002: Characteristic Corrosive Wastes

~~Subissue~~ Proposed Insoluble Salt Requirement

~~Comment~~

Further, EPA's entire premise seems to rest on the supposed advantages of insoluble calcium sulfate compared to soluble sodium sulfate. The solubility of calcium sulfate, however, is actually moderately high - approximately 2g/L (i.e., 2000 ppm). While the neutralization of concentrated sulfuric acid with lime would generate a high percentage of insoluble calcium sulfate, the neutralization with lime of more dilute sulfuric acid streams at a pH range near 2 (which are probably more typical of industrial settings than are concentrated sulfuric acid streams), would generate primarily soluble calcium sulfate.*

* Based on our experience, we believe that treatment of a pH 2 stream of dilute sulfuric acid would generate a significant quantity of sludge, but the primary component of that sludge would be unreacted lime, and not calcium sulfate. Thus, treatment of a pH 2 stream of sulfuric acid with lime could yield the worst of both worlds - dissolved salts at virtually the same levels that would result from use of caustic plus a significant quantity of sludge.

...
Consent Number 3-B-30 (continued)

Docket Number LD12-00267

Consentant Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Consentant

The proposed requirement for the generation of an insoluble salt is even less supportable as applied to deep well injection. In deep wells, there cannot be any adverse environmental consequences from the impact of soluble salts on the receiving waters. Indeed, at one Allied facility that utilizes deep well injection, dilute wastewater is injected into a deep dolomite formation containing water with naturally occurring levels of total dissolved solids of above 30,000 ppm. The injection of a solution containing soluble salts formed as the product of neutralization could not significantly alter the chemical concentration in the injection zone, so there is no possible adverse effect in such a disposal environment. Moreover, the injection of insoluble salts into deep wells could accelerate the plugging of the injection zone, or lead to fouling and plugging of the injection pipe. Clearly then, there is no conceivable justification for applying the proposed insoluble salt treatment standard to deep well injection.

COMMENT NUMBER: 3-B-30
DOCKET NUMBER: LD12-00267
COMMENTER: Allied Signal, Inc.
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The insoluble salt requirement for D002 acidic and alkaline wastes was initially proposed because the Agency prefers the neutralization of D002 waste such that relatively nontoxic solid wastes are precipitated out of solution rather than discharging wastes with high dissolved solid contents. The Agency believes that discharges with high dissolved solids such as sodium sulfate could enhance algal growth and potentially have adverse impacts on fresh water ecosystems. The Agency still believes that insoluble salts such as sodium sulfate can have an adverse affect on fresh water ecosystems. However, the Agency believes that individual wastewater discharge permits (NPDES or POTW) are sufficient to control releases of soluble compounds into the environment from the treatment of D002 wastes.

The Agency also received many comments requesting clarification of the term "insoluble salt." Due to the various degrees of solubility of salts, the Agency believes that the term "insoluble cannot be positively defined. Therefore, this definition would be open to interpretation and likely cause confusion.

EPA agrees with the comments described above; and therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits are sufficient to control releases of soluble compounds into the environment from the treatment of D002 wastes. Therefore, the Agency is promulgating

COMMENT NUMBER: 3-B-30 (continued)
DOCKET NUMBER: LD12-00267
COMMENTER: Allied Signal, Inc.
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number

3B-31

Docket Number

LD12-00267

Commenter

Allied Signal, Inc.

Issue

D002: Characteristic Corrosive Wastes

Subissue

Proposed Insoluble Salt Requirement

Comment

2. It Is Impossible To Generate Insoluble Salts In
the Treatment of Many Wastes

Whatever the merits of requiring the generation of calcium sulfate instead of sodium sulfate in the neutralization of sulfuric acid streams, the proposed treatment standard would apply to all acidic and alkaline corrosive streams, and for many of those streams the generation of a non-toxic insoluble salt is simply impossible.

For example, it is our understanding that there is no acid which can be used to generate an insoluble salt in the neutralization of alkaline corrosive streams.¹¹ Allied's Moncure, North Carolina, facility regularly generates a concentrated alkaline corrosive stream that is joined with 50,000 gallons per day of pH 8.5 process wastewaters. Treatment of this stream -- whether the concentrated stream or the total process stream -- cannot possibly generate an insoluble salt.¹²

¹¹ A salt such as ferric sulfate perhaps could be used to neutralize an alkaline waste stream, generating insoluble ferric hydroxide. However, a soluble sulfate salt would also be generated in the process, completely defeating any purpose to be served by the insoluble salt requirement.

¹² Even if there were some way to prevent the discharge of the soluble salts created by neutralization of this stream, the reduction in the TDS contained in the effluent would be relatively insignificant, due to high salt levels generated by aspects of the process at this facility unrelated to neutralization.

...
Consent Number 3-B-31 (continued)

Docket Number LD12-00267.

Consentee Allied-Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comments

Likewise, there is no way of which we are aware to generate an insoluble salt from the neutralization of nitric or acetic acid.¹² Moreover, the only way to generate an insoluble salt from the neutralization of hydrochloric acid is to use the hydroxides of silver, lead, or mercury,¹³ but the adverse environmental consequences of utilizing these heavy metal hydroxides certainly grossly outweigh any conceivable benefit of eliminating a soluble salt. Indeed, it is quite possible that the wastewater generated from the use of such hydroxides would cause violations of the water quality criteria in the receiving stream,¹⁴ and it seems possible that the insoluble metallic salt produced would be EP toxic.

¹² See Donald Gregg, *Principles of Chemistry* (2d ed., 1963) at 413 (the generally readily soluble ionic compounds include "all acetates" and "all nitrates"). The failure to discuss in the preamble or the technical background document the implications of the solubility of all nitrate salts for the proposed insoluble salt treatment standard is particularly egregious in light of the recognition in the preamble that nitric acid is the second most commonly used industrial acid.

¹³ *Id.* (all chlorides are soluble except those of silver, mercury(I), and lead).

¹⁴ For example, the chronic water quality criterion for silver is 0.12 micrograms per liter (0.12 parts per billion), while the solubility of silver chloride in water is 1.8×10^{-3} grams per liter, *id.*, which means that in otherwise pure water the concentration of silver would be 1.3 milligrams per liter (1.3 parts per million). The discharge would have to be diluted by more than 10,000 times to avoid a violation of the water quality standard.

Comment Number 3-B-31 (continued)

Docket Number LD12-00267

Commenter Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

For some waste streams, treatment with lime could produce serious and unnecessary environmental problems. For example, at Allied's Hopewell, Virginia, facility, at least one of the characteristically hazardous waste streams contains significant levels of organic acids that, if neutralized with lime, would produce substantial volumes of a gelatinous sludge. This sludge would be extremely difficult to manage, and requiring its generation cannot be justified on environmental grounds. Neutralization with caustic does not create the sludge management problems, and it allows the organics to reach the POTW, where the organics are appropriately biodegraded. However, if these regulations require Allied to generate an insoluble salt by using lime, Allied would be forced to create an environmental problem resulting in more difficult and environmentally less protective waste disposal.

COMMENT NUMBER: 3-B-31
DOCKET NUMBER: LD12-00267
COMMENTER: Allied Signal, Inc.
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received several comments, including this one, indicating that the proposed insoluble salt requirement would prevent optimum operation at underground injection wells by causing such things as plugging, affecting long term drift, and increasing the likelihood of waste movement up an abandoned borehole. These affects will cause a decrease in the life of the well and may cause the waste plume to expand proportionately.

The Agency proposed the insoluble salt requirement to protect fresh water ecosystems. However, this is not applicable to underground injection wells because they do not have discharges to fresh water ecosystems. By proposing the insoluble salt requirement, the Agency did not intend to interfere with the optimum performance of the injection well.

Comment Number: 3-B-32

Docket Number: LD12-00270.

Comment: ETICAM

Issue: D002: Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirement

Comment:

8. Corrosive characteristic wastes, page 48479

The requirement to only form insoluble sulfates would prohibit the use of caustic soda as a neutralizing agent. This results in generating larger amounts of sludges, and lower metal contents, not acceptable to smelters in some cases. This would result in the generation of more sludges requiring landfilling.

Additionally many municipalities are restricting the discharge of TDS containing water to sewer systems, and while the use of lime vs caustic soda may achieve this end, the use of evaporation technology is penalized. Most evaporator systems are highly susceptible to scaling and inoperable when water from lime neutralization is fed to the system. ETICAM has actually experienced this in their evaporator system. The manufacturer of the equipment was unable to provide a workable solution to the scaling problem.

COMMENT NUMBER: 3-B-32
DOCKET NUMBER: LD12-00270
COMMENTER: ETICAM
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

EPA received many comments against the proposed insoluble salt requirement. Commenters such as this one, noted that the insoluble salt requirement would unnecessarily use up valuable landfill space and adversely affect wastewater treatment systems. Other commenters indicated that soluble salts should not be regulated as part of the land disposal restrictions because discharges to freshwater ecosystems from wastewater treatment facilities are currently regulated by either NPDES or POTW permits. Also, the Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some D002 wastes such as nitric acid, hydrochloric acid, and other acid halides. As noted by several commenters, there are no essentially insoluble nitrate salts and a requirement to form an insoluble chloride salt (silver chloride) would be impractical and actually may be the formation of a hazardous waste.

The Agency agrees with the points describe above that were made by this and other commenters. Based on this, the Agency has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 acidic and alkaline wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number

3-B-33

Docket Number

LD12-L0007

Commenter

CMA

Issue

D002: Characteristic Corrosive Wastes

Subject

Proposed Insoluble Salt Requirement

Comment

B. BDAT for Corrosive Wastes (D002) Disposed of By Deepwell Injection Should Be "Treatment to Remove the Characteristic."

1. The Formation of Insoluble Salts in the Treatment of Corrosive Wastes Destined for Deepwells is Inconsistent with the Goals of RCRA, HSWA, and the Agency's Own Pollution Prevention Policy.

The proposed D002 (acid and alkaline) treatment standard requires the formation of insoluble salts. As explained in Section XV. H. of these comments, the treatment standard proposed for D002 acid and alkaline wastes is ill-advised because it is technically infeasible and environmentally undesirable. This treatment standard is even more untenable as applied to wastewaters that will be injected after treatment. The Agency's proposed requirement to generate insoluble salts in the course of neutralizing D002 corrosive wastes will dramatically increase the amount of solid waste that must be treated and landfilled: a result seemingly in conflict with the Agency's own Pollution Prevention Policy. The proposed BDAT will also increase potential risks to human health and the environment by placing millions of unnecessary pounds of salt in landfills and increasing the potential mobility of the lower density wastewaters that are injected. ←

...
Comment Number 3-B-33 (continued)

Docket Number LD12-L0007.

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue — Proposed Insoluble Salt Requirement

Comment

As discussed above, many deepwell injection facilities blend waste streams of differing pH both for treatment and to improve injection and down-hole confinement. The Agency's proposal will prohibit such beneficial comingling and require that corrosive waste streams be treated separately. Such facilities will have to use significant amounts of other chemicals to neutralize the waste streams, and will generate large quantities of salts which cannot then be injected.

In proposing this approach, the Agency implicitly assumes that the disposal of such salts into surface landfills will be more protective of human health and the environment. Regardless of whether this assumption is appropriate with respect to "surface aquatic ecosystems" (a proposition for which the Agency offers scant support), such an assumption is indefensible with respect to deepwell injection and is directly refuted by the Agency's own conclusions about the relative risks of surface landfills as compared with deepwell injection of hazardous wastes. See U.S. Environmental Protection Agency, OSWER Comparative Risk Project viii, Table ES-1 & 7-12 (September 1989). Thus, applying this standard in the deepwell injection context involves a conscious comparative risk judgment that is refuted by the Agency's own studies. Accordingly, the BDAT standard for corrosive acid and alkaline wastes should be changed to "treatment to remove the characteristic."

Comment Number 3-13-33 (continued)

Docket Number LD12-L0007.

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

The reasons why the Agency's proposal will pose greater risks are easily explained. Insoluble salt sludges are difficult to dewater and typically have a mass that is three times that of the salt produced (due to water in the sludge matrix). Brine solutions are difficult to solidify and are assumed to require a 100 percent addition (by weight) of the solidifying agent, or a doubling in weight of the waste for disposal. See Illinois Department of Energy and Natural Resources, Evaluation of Underground Injection of Industrial Waste in Illinois at 7-7, 7-19 (1989) [hereinafter "Illinois Underground Injection Evaluation"]. Solidification and fixation do not always prevent leachate formation; they may only reduce the concentrations at which hazardous substances leach in the landfill.

Studies show that injecting brines into highly saline aquifers is environmentally preferable to landfill disposal of solidified salts.

In most cases, a comparison of the tightness (lack of permeability) and thickness of confining materials, the existence of conditions that can cause changes in the characteristics of confining materials, and the magnitude of hydraulic head gradients between the disposed wastes and the nearest USDW shows that conditions are generally less favorable for safe disposal in the near future landfill environment than in the environment of a deep disposal zone. Illinois Underground Injection Evaluation at 7-21, 7-22.

Comment Number 3-B-33 (continued)

Docket Number LD12 - L0007

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed Insoluble Salt Requirement

Comment

This is consistent with the broader conclusions of the OSWER Comparative Risk Project (at 8-12). Even where the OSWER study considered a broader range of underground injection, it still concluded that land disposal poses a higher relative risk in all categories than underground injection. *Id.* Where the study narrowed its focus to consider non-acute health effects, such as potential cancer risk, from injecting hazardous waste into Class I injection wells, the study concluded that "[r]isks associated with. . . Underground Injection appear to be very low." *Id.* at 18.

Requiring the formation of insoluble salts for the D002 (acid and alkaline) subcategory also could render the waste stream less suitable for deepwell injection. Removing salts prior to injection will decrease the density of the waste stream. A significant decrease in density can affect the long term drift and the likelihood of waste movement up and abandoned borehole. By substantially increasing the volume of waste injected, moreover, such a pretreatment requirement will decrease the life of the injection well and may cause the waste plume to expand proportionately. Accordingly, the proposed EDAT treatment method should not be required for injected wastes. Neutralization to eliminate the characteristic will be more protective of human health and the environment.

COMMENT NUMBER: 3-B-33
DOCKET NUMBER: LD12-L0007
COMMENTER: CMA
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received several comments, including this one, indicating that the proposed insoluble salt requirement would prevent optimum operations at underground injection wells. The Agency proposed the insoluble salt requirement in order to protect fresh water ecosystems. However, this is not applicable to underground injection wells because they do not have discharges to fresh water ecosystems. By proposing the insoluble salt requirement, the Agency did not intend to interfere with the optimum performance of an injection well. The Agency also agrees with commenters who stated that the insoluble salt requirement could negate using alkaline and acidic waste streams generated onsite to co-neutralize each other. EPA believes that co-neutralization is a sensible and beneficial management practice and therefore should not be restricted by an insoluble salt requirement.

The Agency therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number 3-B-34

Docket Number LD12-L0023

Commenter Racon, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Proposed pH requirement

Comment

2. Neutralization to produce insoluble salts is very confusing. There is no definition in the proposed regulation for "insoluble", "slightly insoluble", "relatively insoluble", etc. This is not very exact, if you are trying to conform to the regulation. Also, I assume you realize that all common sodium salts are soluble - this means that neutralization of acidic solutions with caustic (NaOH) is impossible. How do you recommend caustic (NaOH) waste streams be neutralized?

Additionally, injection of insoluble salts into deepwell strata could cause such high solids content that deepwell injection is interrupted by plugging of strata pores.

COMMENT NUMBER: 3-B-34
DOCKET NUMBER: LD12-L0023
COMMENTER: Racon Inc.
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency received several comments, including this one, indicating that the proposed insoluble salt requirement would prevent optimum operation at underground injection wells by causing such things as plugging, affecting long term drift, and increasing the likelihood of waste movement up an abandoned borehole. These affects will cause a decrease in the life of the well and may cause the waste plume to expand proportionately.

The Agency proposed the insoluble salt requirement to protect fresh water ecosystems. However, this is not applicable to underground injection wells because they do not have discharges to fresh water ecosystems. By proposing the insoluble salt requirement, the Agency did not intend to interfere with the optimum performance of the injection well.

The Agency received many comments indicating that the formation of insoluble salts is either impractical or impossible for some common D002 wastes such as nitric acid, hydrochloric acid, and sodium hydroxide as noted by this commenter. The Agency also received several comments requesting the term "insoluble salts" be clarified. Due to the various degrees of solubility of salts, the Agency believes that the term "insoluble" cannot be positively defined. Therefore, this definition would be open to interpretation and likely cause confusion.

COMMENT NUMBER: 3-B-34 (continued)
DOCKET NUMBER: LD12-L0023
COMMENTER: Racon Inc.
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

EPA agrees with the comments described above; and therefore, has reconsidered and is not promulgating the "insoluble salt" requirement. The Agency believes that individual facility discharge limits are sufficient to control releases of soluble compounds into the environment from the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number: 3-B-35
Docket Number: L012-00272
Commenter: General Dynamics
Issue: 0002-Characteristics Corrosive Wastes
Subissue: Proposed Insoluble Salt Requirement
Comment:

We currently precipitate metals such as chromium, copper, aluminum, iron, etc. from acid solutions using sodium hydroxide. Included among these acids are nitric and sulfuric. EPA has expressed concern about the effects upon the environment of soluble sulfates and nitrates from the neutralization of sulfuric and nitric acids.

For this reason, EPA has proposed lime and sulfide precipitation as the method of choice for the removal of metals. It is EPA's belief that doing so will eliminate the formation of soluble sodium sulfate and sodium nitrate salts.

We support the EPA in making neutralization and precipitation the preferred technology. However, we do not believe the EPA should specify what neutralization agents to use. We offer the following considerations.

Lime has some advantages:

- 1) It is somewhat cheaper than sodium or magnesium hydroxide.
- 2) It produces insoluble calcium sulfate eliminating the sodium sulfate emissions into the discharge water.
- 3) It produces a thicker floc which settles more rapidly.

Lime also has some major disadvantages:

- 1) Due to the highly corrosive nature of powdered lime, handling it can be difficult and expensive as well as create potential health hazards.
- 2) The fugitive emissions from the handling of dry lime can be very messy and difficult to clean up.
- 3) Lime must be slaked (hydrated) to maximize its usefulness and minimize neutralization time. Lime slurries must be continually circulated to prevent settling.

Comment Number: 3-B-35 (continued)

Docket Number: L012-00272

Commenter: General Dynamics

Issue: D002-Characteristic Corrosive Wastes

Subissue: Proposed Insoluble Salt Requirement

Comment:

- 4) Lime is slower to react than sodium hydroxide which can cause over-treatment of acid solutions. Subsequent high pH's could cause exceedances of wastewater permits as well as some metal hydroxides to redissolve.
- 5) Lime generates a substantially higher volume of sludge than sodium hydroxide. In the presence of sulfuric acid, an insoluble precipitate of calcium sulfate is formed requiring a much higher usage of lime. With the national capacity for land disposal decreasing so rapidly, the increased production of sludge would only compound the problem.
- 6) Lime has a tendency to cake up creating both pumping and control problems. The result of such problems could create difficulties in meeting pretreatment standards.
- 7) Converting over to a lime neutralization system can be very expensive for those facilities not already set up to handle it properly.

This facility is currently considering a change from sodium hydroxide to magnesium hydroxide to further reduce sludge generation and improve effluent quality. Lime would not be voluntarily considered for use at this facility.

The EPA has also proposed sulfide precipitation as a supplement to lime precipitation (e.g. page 48447). Sulfides are more effective at precipitating some metals, such as copper, but they too have their disadvantages. Most pressing is that the presence of sulfides makes it extremely difficult for an industry to market its wastes for recycling or as raw materials. For example, we currently send our spent caustic off-site as a raw material. The buyer has stated that it prefers not to have sulfides in the caustic. Acid treatment of the caustic material to remove sulfides results in toxic hydrogen sulfide gas production. Further, it is our understanding that some landfills have limits on the amount of sulfides which they will accept in a sludge.

In summary, we support neutralization and precipitation as the preferred technology for metal removal from waste acids. However, we do not agree that the EPA should determine specifically what neutralization agents to use. While lime is cheaper and produces a better floc, it is also much harder to handle, slower acting, and generates a substantially higher amount of sludge to be disposed. Sulfides can severely limit the uses or treatments of the sludge for recycling or disposal purposes.

COMMENT NUMBER: 3-B-35
DOCKET NUMBER: LD12-00272
COMMENTS: General Dynamics
ISSUE: D002: Characteristic Corrosive Wastes
SUBISSUE: Proposed Insoluble Salt Requirement
RESPONSE:

The Agency therefore, has reconsidered and is not promulgating the "neutralization with acid/bases" and the "insoluble salt" requirements. The Agency believes that individual facility discharge limits will control releases of soluble compounds into the environment as a result of the treatment of D002 wastes. Therefore, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number: 3-C-1
Docket Number: LD12-00110
Commenter: Thermal KEM/CyanokEM
Issue: D002- Characteristic Corrosive Wastes
Subissue: Incineration
Comment:

We also urge EPA to consider incineration combined with alkaline scrubbing of flue gases as effective neutralization or deactivation for D002 corrosive wastes. Corrosive wastes when fed to an incinerator are destroyed and any acidic byproduct gases are removed by the scrubber. These resultant residuals, ash and scrubber water are neutral in pH. Therefore, incineration is also appropriate BDAT for all corrosive wastes. We recommend that EPA make clear that incineration is a proper method of neutralization for D002 acids and alkalines.

COMMENT NUMBER: 3-C-1
DOCKET NUMBER: LD12-00110
COMMENTER: ThermalKem/CyanoKem
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, and other D002 wastes with organics. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity.

Comment Number: 3-C-2

Docket Number: LD12-00124

Commenter: Rollins

Issue: D002-Characteristic Corrosive Wastes

Subissue: Incineration

Comment:

DEACTIVATION AS A TREATMENT TECHNOLOGY

EPA raises the issue (Preamble, p. 48419-20) as to whether "Deactivation" is an appropriate required treatment technology for certain characteristic wastes, or whether a series of technologies should be spelled out -- e.g., "thermal destruction, specialized incineration ...".

We see no problem in using the general term "deactivation", if the Preamble to the final regulation makes clear which technologies are included in that term. Otherwise, there may be varying interpretations as to whether or not a particular technology is considered to provide "deactivation" of a given waste.

EPA suggests (p. 48424, first column, third paragraph) that incineration is a proper form of deactivation for D002 "other corrosives". However, this should be made more explicit.

EPA makes clear in the Preamble (p. 48424, left-hand column) that incineration is an appropriate form of treatment (i.e., deactivation) for the D002 "Other Corrosives" subcategory. However, it does not make similarly clear whether or not it considers incineration as appropriate treatment (i.e., neutralization) for the D002 "Acid" and "Alkaline" subcategories. RES believes incineration is an appropriate treatment.

Many D002 Acid and Alkaline wastes presently are incinerated. The incineration process changes the chemical composition of the waste and off-gases are scrubbed and neutralized in wet scrubbers. In any event, no corrosive liquid residues remain.

Moreover, many hazardous waste streams are generated as D001/D002 liquid wastes. Since incineration is the proposed specified technology for D001 liquid ignitables -- in which RES concurs -- if neutralization as a specified technology for D002 acids and alkalines does not include incineration, how must D001/D002 wastes be treated? Neutralization of the waste before incineration would serve no useful environmental purpose. And since no corrosive liquid remains after incineration, neutralization at that point is not feasible, appropriate or necessary.

In short, RES recommends that EPA make clear that incineration is a proper method of neutralization or treatment for D002 acids and alkalines, particularly where the waste is a D001/D002 waste.

COMMENT NUMBER: 3-C-2
DOCKET NUMBER: LD12-00124
COMMENTER: Rollins
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, and other D002 wastes with organics. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity.

COMMENT NUMBER: 3-C-3
DOCKET NUMBER: WD12-00118
COMMENTER: SANDIA NATIONAL LABORATORIES
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Incineration
COMMENT:

1. Corrosive Wastes (D002) in Lab Packs

EPA is proposing neutralization of corrosive wastes to pH 6-9 and treatment to convert to insoluble salts or recovery. While these steps are appropriate for larger waste streams, we feel that there may be a safety and capacity problem for the treatment of lab pack quantities of corrosives. Neutralizing and treating lab packs will be labor intensive and require workers to open each lab pack and handle each D002 container. This procedure unnecessarily exposes workers to safety hazards during the extra handling steps. Further, due to the variety of corrosives in the lab pack, the wastes may not be amenable to one treatment method for conversion into insoluble salts. The small quantities are also not feasible for recovery. At this time, none of our disposal vendors are prepared to treat D002 lab packs in the manner proposed in the regs.

In the preamble III.A.8 on Pg 48470, it is indicated that 'Ignitable and corrosive wastes may be included in the "organic lab pack" provided they comply with the requirements for incompatible wastes....' However, in the proposed regs 40 CFR 268 Appendix IV (pg 48529), D002 wastes were not included in the list as permissible for lab packs intended for incineration.

We propose that D002 wastes in lab packs be exempted from the above neutralization and treatment requirement. Instead, D002 lab packs may be incinerated, the scrubber wastes and ashes will be treated to ensure pH 6-9 and stabilized. This will decrease handling hazards to workers and not compromise the quality of wastes that are landfilled. This also implies that D002 wastes do not have to be combined with Appendix IV organic wastes in order to be treated under the alternative treatment standards.

COMMENT NUMBER: 3-C-3
DOCKET NUMBER: D12-00118
COMMENTER: Sandia National Laboratories
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, other D002 wastes with organics, and D002 lab packs. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity in the treatment residuals. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number:

3-C-4

Docket Number:

LD12-00141

Commenter:

Washington State University

Issue:

D002-Characteristic Corrosive Wastes

Subissue:

Incineration

Comment:

4. Page 48529 Appendix IV -

The list should include D002 organic acids and bases. The destruction of the hazard from an organic acid and base is safer to those of us who have to manage these wastes and better managed through incineration rather than through neutralization and the generation of an insoluble salt.

COMMENT NUMBER: 3-C-4
DOCKET NUMBER: LD12-00141
COMMENTER: Washington State University
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, other D002 wastes with organics, and D002 lab packs. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity.

Comment Number: 3C-5

Docket Number: LD12-00054

Commenter: Ross Environmental Services, Inc.

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Incineration

Comment:

Corrosive Waste:

Ross received approximately 3 million gallons of corrosive waste waters in 1988. These waters are often high in organic content and contain significant BTU value. Neutralizing with acids or bases prior to incineration is an unnecessary step. The Agency must acknowledge that incineration is an appropriate deactivation and/or neutralization process. Enclosed are representative waste profiles for wastes that were incinerated.

COMMENT NUMBER: 3-C-5
DOCKET NUMBER: LD12-00054
COMMENTER: ROSS ENVIRONMENTAL SERVICES
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, and other D002 wastes with organics. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to below the characteristic level, excluding open burning and open detonation." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity.

COMMENT NUMBER: 3-C-6
DOCKET NUMBER: LD12-00159
COMMENTS: Waste Management, Inc./Chemical Waste Management, Inc.
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration
COMMENT: iv. Incineration of Corrosive Wastes
(54 Fed. Reg. at 48,422)

EPA's proposal to establish BDAT Treatment Standards for three broad categories of D002 characteristic wastes would significantly impact the needed ability to burn certain corrosive wastes. WMI currently incinerates liquid corrosive wastes in bulk and lab pack quantities at its TWI and Chicago facilities. These waste streams are typically organic acids or corrosive liquids mixed with organics.

The treatment standards proposed for the "acid" and "alkaline" subcategories of D002 wastes are appropriate only for a limited portion of the universe of possible D002 waste streams. It is appropriate to treat certain acids and bases by neutralization (e.g., nitric acid, sulfuric acid, and phosphoric acid). However, many of the D002 corrosive wastes are organic acids or mixtures of compounds including U & P codes, and neutralization of an organic acid will not provide the necessary treatment for the organic element of such waste. By comparison, incineration provides proper treatment, and results in residues that are neutralized prior to land disposal. Incineration of these wastes is also necessary because neutralization facilities have limits on the acceptable level of organics, which would preclude the acceptance of organic acids and corrosive mixtures containing organics.

COMMENT NUMBER:

3-C-6 (continued)

DOCKET NUMBER:

LD12-00159

COMMENTS:

Waste Management, Inc./Chemical Waste Management, Inc.

ISSUE:

D002 - Characteristic Corrosive Wastes

SUBISSUE:

Incineration

COMMENT:

EPA should amend its BDAT for certain corrosive wastes to include incineration. In the preamble discussion of the "Other D002 Corrosives" category, the Agency references chemicals that may contribute to corrosivity (i.e., Ferric chloride, benzene sulfonyl chloride, benzotrichloride, acetyl chloride, formic acid, hydrofluoric acid etc.) 54 FEd. Reg. at 48,424. Some, if not all, of these compounds fall into the "acid" or "alkaline" categories and contain organics, making them incineration candidates. Chemical Waste Management has utilized a formic acid solution in the trail burn process for its incinerators as a Principal Organic Hazardous Constituent (POHC) to demonstrate Destruction and Removal Efficiency (DRE) for aqueous POHCs. Formic acid, listed on the ranking of incinerability for Appendix VIII, Part 261 compounds, has a heat of combustion at 1.32 Kcal/gram. Other examples of corrosive wastes which should be incinerated are: hydrazine, which in aqueous solution, is a corrosive material; acetic acid and water; cresylic acid and methylene chloride paint stripper; butyric acid; and amines.

Therefore, WMI recommends that the Agency establish BDAT treatment standards for organic acids or bases requiring incineration. As illustrated above, application of the incinerability index indicates that most hazardous waste incinerators will destroy the materials. Residues from the incineration process should be treated, as appropriate, to a neutral pH prior to land disposal or discharge to a POTW.

COMMENT NUMBER: 3-C-6
DOCKET NUMBER: LD12-00159
COMMENTER: Waste Management, Inc./Chemical Waste Management, Inc.
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, and other D002 wastes with organics. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to below the characteristic level, excluding open burning and open detonation." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity.

Comment Number: 3- C-7

Docket Number: LD12-00172

Commenter: HWTC

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Incineration

Comment:

2. Incineration Of D002 Wastes

EPA makes clear in the preamble (p. 48424, left-hand column) that incineration is an appropriate form of treatment (i.e., deactivation) for the D002 "Other Corrosives" subcategory. However, it does not make similarly clear whether or not it considers incineration as appropriate treatment (i.e., neutralization) for the D002 "Acid" and "Alkaline" subcategories. The HWTC believes incineration is an appropriate treatment.

Many D002 Acid and Alkaline wastes presently are incinerated. One of our member companies, Ross Incineration, Inc., has submitted a comprehensive data package on D002 wastewaters amenable to incineration. The incineration process changes the chemical composition of the waste. The off-gases may be scrubbed and neutralized in a wet scrubber. In any event, no corrosive liquid residues remain.

... Comment Number 3-C-7 (continued)

Docket Number LD12-00172.

Commenter HWTC

Issue D002 - Characteristic Corrosive Wastes

Subissue Incineration

Comment

Moreover, many hazardous waste streams are generated as D001/D002 liquid wastes. Since incineration is the proposed specified technology for D001 liquid ignitables - in which the HWTC concurs - if neutralization as a specified technology for D002 acids and alkalines does not include incineration, how must D001/D002 wastes be treated? Neutralization of the waste before incineration would serve no useful environmental purpose. And since no corrosive liquid remains after incineration, no neutralization at that point is feasible, appropriate or necessary.

In short, HWTC recommends that EPA make clear that incineration is a proper method of neutralization for D002 acids and alkalines. Neutralization of corrosive wastes prior to incineration is not necessary and should not be mandated in the final rule. We urge EPA to consider incineration combined with alkaline scrubbing of flue gases as effective neutralization or deactivation for D002 corrosive wastes. Corrosive wastes when fed to an incinerator are destroyed and any acidic byproduct gases are removed by the scrubber. These resultant residuals, ash and scrubber water are neutral in pH. Therefore, incineration is also appropriate BDAT for all corrosive wastes. We recommend that EPA make clear that incineration is a proper method of neutralization for D002 acids and alkalines.

COMMENT NUMBER: 3-C-7
DOCKET NUMBER: LD12-00172
COMMENTER: HWTC
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, and other D002 wastes with organics. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to below the characteristic level, excluding open burning and open detonation." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity.

Comment Number 3-C-8

Docket Number LD12-00206

Commenter University of Washington

Issue D002: Characteristic Corrosive Wastes

Subissue Incineration

Comment

3. D002 acid and alkaline subcategories. The University of Washington (and most universities and colleges) routinely generate organic acids and bases which would fall into the acid and alkaline subcategories. These include carboxylic acids, sulfonic acids, and aliphatic amines. (We noted that the discussion on page 48424 classified organic corrosives in the "other corrosives" subcategory. Many of these materials, especially when in aqueous solution, should be classified in the acid or alkaline subcategory, as they are considered corrosive because of a measurable pH, not failure of the corrosivity to SAE 1020 steel test.) While these materials can be neutralized, incineration is often the preferred management method. Simple neutralization leaves salts which are sometimes toxic or carcinogenic (e.g. methanesulfonic acid), while incineration of these materials removes both the characteristic and destroys toxic organic constituents.

A similar issue concerns mixtures of inorganic acids and bases with organic constituents. Typical examples include saturated potassium hydroxide in ethanol and hydrochloric acid/alcohol mixtures. Again, incineration effectively removes the characteristic and destroys the organic constituents.

We believe that EPA should either redefine the subcategories to account for the wastes discussed above or propose a second treatment standard of "incineration as a method of treatment" for the D002 acid and alkaline subcategories. We urge EPA not to rely on the variance process for organic acids and bases and the mixtures described above, as these wastes are quite common and the variance process is unnecessarily burdensome, especially for complex, small volume wastes.

COMMENT NUMBER: 3-C-8
DOCKET NUMBER: LD12-00206
COMMENTER: University of Washington
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, and other D002 wastes with organics. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to below the characteristic level, excluding open burning and open detonation." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity.

...
Comment Number 3-C-9

Docket Number LD12- L0005.

Commenter KODAK

Issue D002: Characteristic Corrosive Wastes

Subissue Incineration

Comment

The Agency Should Allow D002 Wastes to be Incinerated

EPA proposes neutralization for both acid and alkaline D002 waste streams. By establishing neutralization (or in some cases, recovery) as a required treatment technology, EPA rules out the possibility of incineration of these streams. As stated at 54 FR 48428, "By establishing these treatment standards, the Agency is leaving open the opportunity to the regulated community to apply for a variance from the treatment standard to account for D002 wastes which can not be effectively neutralized or recovered (40 CFR 268.44). Such a situation could occur for small quantities (emphasis added) of corrosive materials that contain extremely toxic or otherwise hazardous chemicals that may cause an unnecessary risk during neutralization."

In the same proposal, EPA proposes to include corrosive wastes in the "organic lab pack category" (54 FR 48470) and the Agency allows "deactivation" as a treatment standard for non-acid/base D002 wastes.

These two approaches are contradictory. Incineration, in many cases, has been chosen as the method of treatment due to worker safety concerns and because of the acceptable treatment of these D002 wastes as part of this process. Incineration significantly decreases worker handling (and thus potential worker exposure) to all D002 wastes. Incineration is also very effective where the corrosive substances are organic acids or mixtures of organic and inorganic acids. Incineration destroys the organic acids so that much less basic material is needed to attain a pH of 6 and there are few organic salts remaining for disposal. Inherent in a well-designed well-operated incinerator is a scrubber system. Through this portion of the treatment, process wastes are effectively neutralized. This form of neutralization uses fewer resources and leaves less residue than conventional wastewater treatment plants.

We support EPA's proposal to allow incineration of corrosive wastes in lab packs and to allow deactivation as the treatment standard for D002 "Other Corrosives" category. We recommend that the incineration/deactivation options be extended to all D002 waste streams.

COMMENT NUMBER: 3-C-9
DOCKET NUMBER: LD12-L0005
COMMENTER: KODAK
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, and other D002 wastes with organics. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to below the characteristic level, excluding open burning and open detonation." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity.

Consent Number 3-C-10

Docket Number LD12-L0010

Comments Hoechst Celanese

Issue D002: Characteristic Corrosive Wastes

Subissue Incineration

Comments

Incineration should be added to partial neutralization as a BDAT treatment alternative.

Incineration is not currently listed as a BDAT treatment alternative by the proposed § 268.42(a)(7). Many hazardous waste incinerators are specifically designed to receive corrosive waste streams. These incinerators adequately render these materials non-corrosive. Therefore, EPA should include incineration as a BDAT treatment standard for corrosive waste streams.

COMMENT NUMBER: 3-C-10
DOCKET NUMBER: LD12-L0010
COMMENTER: Hoechst Celanese
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, and other D002 wastes with organics. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to below the characteristic level, excluding open burning and open detonation." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity.

Comment Number 3-C-11

Docket Number LD12-L0032

Commenter Covington & Burling

Issue D002: Characteristic Corrosive Wastes

Subissue Incineration

Comments

D002 Corrosive Wastewaters

Ross Environmental Services, Inc. submitted data in support of its comment opposing neutralization as a method of treatment as the treatment standard for D002 wastes and urging the Agency to permit incineration of such wastes. It is OCF's belief that Ross Environmental Services and others (see Waste Management Comments at 84) have misinterpreted the effect of the Third Third Land Ban. As we understand the proposed regulations, the Third Third Land Ban would not prohibit treatment of corrosive wastes by incineration and would not require neutralization prior to incineration because wastes treated by incineration are not destined for land disposal. Only the incinerator residue, if any, would be destined for land disposal and therefore subject to the land ban treatment standards. Please clarify this point in the final rule.

COMMENT NUMBER: 3-C-11
DOCKET NUMBER: LD12-L0032
COMMENTER: Covington and Burling
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, and other D002 wastes with organics. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to below the characteristic level, excluding open burning and open detonation." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity.

Comment Number 3-C-12

Docket Number LD12-L0034

Commenter HWTC

Issue D002: Characteristic Corrosive Wastes

Subissue Incineration

Comment

2. Incineration Of D002 Waste

The Agency must recognize that incineration of corrosive wastes is a legitimate treatment technology. Neutralization prior to the incineration process does not add any environmental benefits. If the corrosive waste also contains metals, the Agency has implemented new incinerator permit conditions to protect the environment from toxic metal air emissions and to require stabilization of residuals that are derived from metal bearing waste. Mandatory neutralization prior to incineration is adding unnecessary intermediate steps. Pretreatment of waste for metal removal via alkaline precipitation should not be confused with neutralization of corrosive wastes.

COMMENT NUMBER: 3-C-12
DOCKET NUMBER: LD12-L0034
COMMENTER: HWTC
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, and other D002 wastes with organics. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to below the characteristic level, excluding open burning and open detonation." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity.

Comment Number: 3 - C - 13

Docket Number: LD10-00011

Commenter: ENSCO

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Incineration

Comment:

Although most acid and alkaline subcategory wastes are treated by neutralization, small quantities of the corrosive wastes are often treated in rotary kiln incinerators to remove the characteristic of corrosive. This treatment by incineration is especially appropriate for D002 wastes that contain high concentrations of corrosive organics.

Incineration in rotary kilns is often used for treatment of small quantities of both acid and alkaline corrosive wastes especially from laboratories. Incineration should be included as an appropriate treatment technology as long as the quantities of corrosives incinerated do not result in damage to either incineration

or emission control equipment and as long as all permit conditions are in compliance.

COMMENT NUMBER: 3-C-13
DOCKET NUMBER: LD10-00011
COMMENTER: ENSCO
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Incineration

The Agency received many comments declaring that incineration should be allowed for D002 wastes, especially for organic acids, mixed D001/D002 waste streams, and other D002 wastes with organics. The commenters indicated that pollution control devices on incinerators are capable of removing corrosive gases from burning D002 wastes, and that scrubber water can be neutralized if necessary. For D002 wastes, the Agency is promulgating a treatment standard of "Deactivation to below the characteristic level, excluding open burning and open detonation." Therefore, incineration of D002 wastes will be allowed as long as the treatment is sufficient to remove the characteristic of corrosivity.

COMMENT NUMBER: 3-D-1
DOCKET NUMBER: LD12-00098
COMMENTS: BP AMERICA INC
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Dilution
COMMENT:

3. Aggregation of D002 Acid and Alkaline subcategory wastes enhances treatment, minimizes salt formation and conserves resources.

EPA recognizes that facilities that generate both an acidic and alkaline waste may be able to utilize the fluctuations in pH as a means of performing on-site neutralization (54 FR 48423). This mixing is clearly not dilution and results in the minimum formation of wastewater and salts. For example, facilities that demineralize water for boiler feed water typically regenerate the ion exchange beds creating an acidic and an alkaline wastewater. Combining these to neutralize the streams avoids the need to use additional acidic or alkaline solutions which, if added, increase the overall volume of wastewater and sludges generated. The Agency should encourage the mixing of wastewater streams to reduce the addition of chemicals needed to neutralize D002 waste and should clearly identify the aggregation as legitimate since it facilitates treatment and is obviously permissible dilution.

In some cases, as acknowledged by EPA, dilution is necessary for treatment of D002 Acid and Alkaline subcategory wastewater to provide a heat sink to control very exothermic reactions or toxic air emissions (54 FR 48423). Allowing aggregation in a centralized treatment unit will minimize the volume of wastewater generated compared to segregating the concentrated D002 wastewater and adding water to control the exothermic reaction.

A typical refinery wastewater treatment system commingles many streams in an extensive sewer collection system. Several of these streams exhibit one or more characteristics of a hazardous waste. The refinery wastewater treatment facility is designed to treat these commingled wastes. The aggregation is done not to avoid a land disposal prohibition but to enhance cost-effective treatment.

4. Corrosives wastes are commingled within refinery wastewater treatment facilities to minimize chemical addition.

A typical refinery wastewater treatment facility manages both spent acids and spent caustics. Commingling of the various waste streams neutralizes these corrosive wastes. When necessary the pH is controlled by the addition of acid or caustic to maintain the pH between 6-9 for oil recovery, biological treatment, and for discharge. Our National Pollution Discharge Elimination System (NPDES) permits limit the effluent pH to within 6 to 9. Obviously the centralized treatment facility treats, not merely dilutes, the spent acid and caustics that are aggregated for treatment.

COMMENT NUMBER: 3-D-1
DOCKET NUMBER: LD12-00098
COMMENTS: ENSCO
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

COMMENT NUMBER: 3-D-2
DOCKET NUMBER: LD12-00116
COMMENTER: MONSANTO
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Dilution
COMMENT:

Monsanto Company is also quite concerned that the discussion of dilution at 54 FR 48423/1 might be construed to prevent the practice of co-neutralization of separate acidic and basic process waste streams. The Agency discusses an example involving dilution with fresh water. While this is not a practice in industry, it certainly is a vitally important practice that process waste streams, particularly wastewater streams, be allowed to be aggregated in a manner that leads to co-neutralization of acidity and basicity in the streams. It would be a violation of the principles of pollution prevention and good sense to require the separate use of virgin acids and bases to accomplish this neutralization.

COMMENT NUMBER: 3-D-2
DOCKET NUMBER: LD12-00116
COMMENTER: Monsanto
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

COMMENT NUMBER:

3-D-3

DOCKET NUMBER:

LD12-00138

COMMENTS:

Occidental Chemical Corporation

ISSUE:

D002-Characteristic Corrosive Wastes

SUBISSUE:

Dilution

COMMENT:

While OxyChem has no problem with neutralization as a technology for acid and alkaline hazardous wastes, we note that EPA's rationale for this treatment is technically unfounded. EPA's example of dilution is based on the assumption that the dilution water is free of all ions with the exception of hydronium and hydroxyl ions (completely deionized water). Since this would require a waste treater to first deionize water, and then use it to dilute a corrosive waste, the scenario is absurd. The actual situation is that any water that would be added to a corrosive waste would contain some ionic species, which would enter into the reaction with the acid or base in the waste. In other words, any real-world addition of water to a corrosive waste

would involve some degree of neutralization; not dilution as EPA's example implies. This concept is of concern to OxyChem since in many cases wastewaters, or wastewaters and solid wastes, with different amounts of acidity and alkalinity are mixed to achieve neutralization. This is not dilution, and should not be characterized as such.

COMMENT NUMBER: 3-D-3
DOCKET NUMBER: LD12-00138
COMMENTER: Occidental Chemical Corporation
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

COMMENT NUMBER: 3-D-4
DOCKET NUMBER: LD12-00095
COMMENTER: American Paper Institute
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: Dilution
COMMENT:

B. The Agency's Technical Rationale For Prohibiting Dilution
of Corrosive Characteristic Waste is Technically Flawed

In the preamble, the Agency states that it prefers neutralization of corrosive wastes over simple dilution because the latter "creates a larger volume of wastes but does not treat or remove hazardous constituents in the wastes." 54 Fed. Reg. 48423/1. The Agency supports this statement with an example in which water is used to neutralize sulfuric acid and concludes that 360,000,000 gallons of water would be required to neutralize one gallon of sulfuric acid. As discussed in greater detail in the comments of the National Council of the Paper Industry for Air and Stream Improvement ("NCASI")^{2/} EPA's example is apparently based on the incorrect assumption that deionized water will be used to dilute 36 normal H_2SO_4 . As NCASI points out, facility owners would not likely use expensive deionized water for this purpose, rather they would use naturally occurring water which almost always contains alkalinity (or acidity) to neutralize acid (or basic)

^{2/} NCASI is a research organization dedicated to addressing environmental, technical, and scientific issues that affect the pulp and paper industry. It performs original research as well as gathers and analyzes existing material that bears on such matters. API/NFPA incorporate NCASI's comments by reference and summarize them here for convenience of the reader.

COMMENT NUMBER:

DOCKET NUMBER:

COMMENTER:

ISSUE:

SUBISSUE:

COMMENT:

3-D-4 continued
LD12-00095
American Paper Institute
D002-Characteristic Corrosive Wastes

Dilution

waste. EPA completely overlooks the fact that such natural water would affect pH by both dilution and chemical reaction. Thus, as NCASI demonstrates in its comments, EPA grossly overestimates the amount of water that would be necessary to chemically neutralize the Agency's hypothesized gallon of sulfuric acid.

Moreover, the Agency's concern about conservation of natural resources such as water is unwarranted because many industries use substantial quantities of water in their production processes and consequently generate large amounts of wastewater that is treated in various wastewater treatment facilities covered by the Clean Water Act NPDES permit program. These wastewaters are already available for neutralization of acid or basic wastes. Thus, no additional water use would be necessary to "pre-treat" corrosive waste for such industries. Accordingly, EPA should rescind its prohibition of dilution by natural water and add that technique to the treatment standards for D002 corrosive wastes.

COMMENT NUMBER: 3-D-4
DOCKET NUMBER: LD12-00095
COMMENTER: American Paper Institute
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

COMMENT NUMBER: 3-D-5
DOCKET NUMBER: LD12-00151
COMMENTS: Gulf Coast Waste Disposal Authority
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution
COMMENT:

G. The Agency should set the standards for D002 acid and alkaline wastes at the characteristic levels, and should specifically allow conneutralization by the mixing of acid and alkaline wastes.

The Agency has provided no rational technical or scientific bases for its proposed standards for acid and alkaline corrosive wastes (D002). Its stated reasons for the proposed standards are contrived and cannot be justified. EPA must set standards for alkaline and acid corrosive wastes at the current characteristic limits; this is the only environmentally and technically justifiable approach for the extremely diverse wastes that compose this subcategory of D002 wastes. Mixture of acid and alkaline wastes must be specifically allowed as a method to achieve the characteristic levels for these wastes. This is consistent with the pollution prevention philosophy and is the most environmentally protective approach for managing characteristic wastes.

COMMENT NUMBER: 3-D-5
DOCKET NUMBER: LD12-00151
COMMENTER: Gulf Coast Waste Disposal Authority
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

...
Comment Number 3-D-6
Docket Number LD18-00168 ...
Commenter American Petroleum Institute
Issue D002 - Characteristic Corrosive Wastes
Subissue Dilution
Comment

III. A.4.c.(1) - Corrosive Characteristic Wastes; D002 Acid
and Alkaline Subcategory

Neutralization to pH 6-9 and insoluble salts is proposed
as the treatment standard for waste hazardous because of pH.
Neutralization must be done with an acid or base, not water
(this would be considered dilution).

COMMENT NUMBER: 3-D-6
DOCKET NUMBER: LD12-00168
COMMENTER: American Petroleum Institute
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

Comment Number 3-D-7

Docket Number LD12-00189

Commenter DuPont

Issue D002- Characteristic Corrosive Wastes

Subissue Dilution

Comment

3. CORROSIVE WASTES

- A. THE PROPOSED TREATMENT STANDARDS FOR D002 ACID AND ALKALINE WASTES ARE NOT ENVIRONMENTALLY OR TECHNICALLY JUSTIFIABLE FOR THE EXTREMELY DIVERSE WASTES THAT COMPOSE THIS SUBCATEGORY.

Du Pont aggregates and collects aqueous process wastes that are corrosive at the point of generation, but lose this characteristic after commingling with other aqueous process wastewaters (typically containing some ionic species) but prior to active biological treatment in surface impoundments. A typical example of such corrosive wastes occurs at one of our Textile Fibers plants where dilute acids used for regeneration of solvents and water treatment ion exchange resin regeneration and strong acids used for equipment cleaning are discharged to the plant's process wastewater treatment system. Many of these streams, at the point of generation, do not fall below pH 2 or above 12.5, and thus are not considered RCRA hazardous wastes. However, a few of the acid streams do fall below pH 2 and would be considered "wastewaters" by EPA's definition. These streams are treatable in the wastewater treatment system because they react with other wastewaters to neutralize the pH and the organics present in such streams are biodegraded in the plant's surface impoundment-based activated sludge treatment plant.

Comment Number 3-D-7 (continued)

Docket Number WD12-00189.

Commenter DuPont

Issue D002- Characteristic Corrosive Wastes

Subissue Dilution

Comment

It appears from the proposed regulations and preamble, that EPA's proposal will totally disrupt industrial operations that aggregate and collect corrosive wastes with other process wastes in a central wastewater treatment facility. EPA proposes to prescribe as BDAT for such corrosive wastes neutralization with acids/bases to a pH between 6 and 9 (resulting in insoluble salt formation). However many industrial operations collect and aggregate corrosive wastes with other wastes (containing some ionic species) to neutralize the wastes (e.g. in line mixing of wastes results in neutralization). This waste stream mixing is typically done to facilitate biological treatment of organic constituents in the wastes and often to minimize solids generation that results from the specific addition of neutralizing agents (e.g. calcium hydroxide). Such aggregation reduces the amount of solids generation compared to the amount that would be generated if each stream were neutralized separately. Presumably, based on our interpretation of EPA's proposal, this type of situation would be considered "impermissible dilution". The proposed regulations would, therefore, prohibit this type of efficient treatment of corrosive wastes, even though the waste was rendered neutral prior to further treatment in accordance with the CWA requirements.

Du Pont believes that the Agency has neglected to consider the fact that many acid and alkaline wastes requiring neutralization often contain organic and inorganic constituents, and that segregation and treatment of these wastes could result in inadequate treatment of associated organic constituents. Moreover, it would be impossible to segregate and collect these waste streams by May 8, 1990, because retrofits and new designs for existing facilities would be required. In some plants, process changes may be required. Additionally, there are often numerous problems associated with space and logistics of implementing source treatment, as well as associated permitting issues.

COMMENT NUMBER: 3-D-7
DOCKET NUMBER: LD12-00189
COMMENTER: DuPont
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

Consent Number 3-D-8

Docket Number LD12-00214.

Comment Browning Ferris Industries

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comment

Another example illustrating the ambiguity of the distinction between dilution and treatment concerns EP toxic wastes for various metals, mixed with various acid wastes, then treated to achieve a pH in the range 6 to 9. The neutralization will result in the generation of insoluble metallic hydroxides, "substantially reduc[ing] the prohibited wastes' toxicity or mobility." Id. Is that treatment, or is it dilution? Does it matter how substantial the EP toxic waste stream is in comparison with the acidic waste stream? Is it necessary to determine the mass of metals removed from the wastewater as a result of the neutralization treatment and any subsequent settling of the precipitates? Is it necessary that the hydroxides be settled out of the treated wastes?

With respect to corrosive wastes, our concern with the distinction between dilution and treatment goes beyond these questions, to the question of whether the dilution concept has any relevance to pH corrosive wastes at all. EPA's primary argument against the permissibility of dilution seems to be that dilution simply creates a larger volume of wastes but does not treat or remove hazardous constituents in the wastes. For pH corrosive wastes, however, there are no hazardous constituents in the waste.

...
Corrosion Number 3-D-8 (continued)

Docket Number LD12-00214

Company Browning-Ferris Industries

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comment

The pH of a liquid is a function of the ratio of hydronium ions to hydroxide ions. Water always contains both hydronium ions and hydroxide ions such that the product of the concentration of these two ions always equals 1×10^{-14} . In other words, when the concentration of hydronium ions is 1×10^{-7} , the concentration of hydroxide ions must also be 1×10^{-7} , and when the concentration of hydronium ions is 1×10^{-4} , the concentration of hydroxide ions must be 1×10^{-10} .

The characteristic of pH corrosivity, then, is not a matter of the presence of a hazardous constituent in the waste, but rather it is a matter of the balance between the hydronium ions and the hydroxide ions. If, as a matter of chemical treatment or if, as a function of mixing with large volumes of pure water, the ratio between hydronium ions and hydroxide ions is brought into rough balance, then in either case there has been the destruction of the hazardous characteristic.

....
Comment Number 3-D-8 (continued)

Docket Number LD12-00214

Commenter Browning-Ferris Industries

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comment

The preamble also argues that "neutralization is more conservative of natural resources and more protective of aquatic ecosystems." 54 Fed.Reg. 48423. To illustrate the claim that neutralization is more conservative of natural resources,⁸ EPA compares the amount of pure water that would be required to bring a gallon of concentrated sulfuric acid up to a pH of 7.0, with the amount of lime or caustic that would be required. Dilution would require an incredible 360,000,000 gallons, while neutralization would require 11 or 12 pounds, depending on the neutralizing agent. While the numbers seem impressive, they are totally irrelevant in the real world, and do not in fact support the preamble's assertion that neutralization is more conservative of natural resources than is dilution.

⁸ The preamble contains no explanation or support for the claim that neutralization is more protective of natural ecosystems.

Comment Number 3-D-8 (continued)

Docket Number LD12-00214.

Commenter Browning-Ferris Industries

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comment

Treatment by dilution will only occur at an industrial facility or at a TSD facility by the mixing of various wastewater streams, and it will not be accomplished by the use of water not already used by the facility for other purposes. Dilution will certainly not put any incremental demand on the natural resource (water). Moreover, the quantity of water that will be necessary to effect treatment is nowhere near the enormous quantity suggested in the preamble. While the preamble is correct that to achieve pH 7 by the dilutive effect of water alone would require the enormous quantity suggested, the wastewaters being mixed would have to be distilled water in order to have no other effect on the pH other than by the dilutive effect. As long as the water being mixed with the pH corrosive wastes is not distilled or otherwise deionized water, the amount of water required to effect neutralization would be orders of magnitude less than that suggested in the preamble.

In terms of the preamble's discussion of "impermissible" dilution, in almost every case (if not in fact every case), the mixing of pH corrosive wastes with other wastewaters will bring about some chemical treatment. While that treatment might not be by "acids" when the corrosive waste is alkaline or by "bases" when the corrosive waste is acidic, as required by the proposed treatment standard, it will in fact be chemical treatment nonetheless.

...
Comment Number 3-D-8 (continued)

Docket Number LO 12-00214

Commenter Browning-Ferris Industries

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comment

For all these reasons, we believe that the concept of "impermissible" dilution has no place in the context of pH corrosive streams, but if EPA persists in its commitment to employ that concept then EPA should explicitly recognize that the mixing of an acidic corrosive waste with any wastewater that has measurable alkalinity (no matter what the pH), or the mixing of an alkaline corrosive waste with any wastewater that has measurable acidity (again, no matter what the pH), constitutes treatment, and therefore does not involve "impermissible" dilution.

COMMENT NUMBER: 3-D-8
DOCKET NUMBER: LD12-00214
COMMENTER: Browning Ferris Industries
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

Comment Number 3-D-9

Docket Number LD12-00224..

Commenter Texaco

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comment

Also related to the issue of acid and alkaline corrosive wastes, is the definition of permissible dilution. A common practice in plants, is to bleed small quantities of spent caustics or acids into the wastewater treatment systems. The acids and alkalies are neutralized by the constituents in the plant wastewaters. This practice has no adverse effects due to NPDES discharge pH requirements of 6-9 and does not utilize any fresh water as given in the EPA example. Under the current proposed rules, this practice appears to be prohibited. Texaco requests that this practice be recognized as a means of neutralizing acid and alkaline corrosive wastes. The installation and permitting of neutralization facilities, the purchase of neutralizing agents, and the removal and subsequent land disposal of insoluble salts from these facilities should not be required since no environmental benefit has been demonstrated by the alternative required by the proposed rule.

Treatment below the characteristic level should not be required for ignitable and alkaline corrosive wastes. The neutralization of acid and alkaline corrosive wastes in wastewater treatment systems by the constituents in those wastewaters should be recognized as an acceptable practice and not considered impermissible dilution.

COMMENT NUMBER: 3-D-9
DOCKET NUMBER: LD12-00224
COMMENTER: Texaco
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

....
Comment Number 3-D-10

Docket Number LD12-00227..

Commenter Union Camp

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comment

EPA prohibition of dilution is overly broad and unreasonable when applied to characteristic corrosive waste. For example, Congress did not intend to disallow dilution which occurs as a normal part of manufacturing operations. Union Camp requests that the Agency's final rule permit dilution that is part of normal manufacturing processes.

COMMENT NUMBER: 3-D-10
DOCKET NUMBER: LD12-00227
COMMENTER: UNION CAMP
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

Corrosion Number 3-D-11

Docket Number LD12-00243..

Comments NCASI

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comments

- (2) The rationale for excluding dilution as a treatment technology for characteristic corrosive wastes is inaccurate, incomplete and misleading. In addition, pH adjustment using natural waters involves significant reaction (as opposed to dilution) and should not, therefore, be prohibited as a form of treatment.

Both the background document and the preamble (FR 54 48422) present a rationale for exclusion of dilution as a treatment for wastes deemed hazardous solely because of pH. The example given to support this exclusion is the dilution of concentrated sulfuric acid with water. The figures presented are apparently based on dilution of 36 normal H_2SO_4 with deionized water.

First we must point out that, because of its value, it is unlikely that acid (or base) of this strength would be discarded.

Second, while the calculations for dilution to pH 2 are reasonably accurate, the calculation for dilution to pH 7 is incorrect. It is theoretically impossible to obtain pH 7 by dilution alone since the pH of pure water is 7. More importantly, however, it is extremely unlikely that owners/operators would choose costly deionized water to dilute pH-corrosive hazardous wastes.

Naturally occurring waters almost always contain natural alkalinity which would be available to react with the acid when the water was used. Consequently, natural waters affect pH by both dilution and reaction. Likewise, most natural waters contain acidity which could react with basic wastes. If even a slight amount of alkalinity were assumed in the preamble example, the volumes of water calculated would be reduced drastically.

Equation 1 is the expression to determine the required dilution ratio in the presence of alkalinity or acidity (assuming the volume of dilution water $\gg$ volume of solution being diluted):

$$V_d/V_o = N_o/(N_d + N_o - 10^{-7}) \quad \text{Equation 1}$$

Where:

- V_d = volume of "dilution" water needed
- V_o = original volume of acid or base being "diluted"
- N_o = original normality of the acid or base
- N_d = normality of acid or base in dilute solution
- N_o = alkalinity or acidity of "dilution" water expressed as normality
- 10^{-7} = hydrogen or hydroxide ion normality due to ionization of water

Consent Number 3-D-11 (continued)

Docket Number LD12-00243..

Consent NCASI

Issue D002: Characteristic Corrosive Wastes

Subissue — Dilution

Comments

Table 1 presents the results for dilution waters over the range of alkalinities that might be encountered in natural waters used to dilute 36N sulfuric acid to pH 2, 6 and 7.

Table 1 Dilution Ratio (V₁/V₂) for Natural Surface Water or Groundwater Dilution of 36N Acid to Specified pH

pH	"Dilution" Water Alkalinity (mg/L as CaCO ₃)					
	0	10	50	100	200	500
2	3600	3529	3272	3000	2571	1800
6	3.6 E 8	179193	35968	17992	8998	3600
7	infinite	180000	36000	18000	9000	3600

It is apparent from the table that even a small amount of naturally occurring alkalinity can account for the majority of the neutralization that is accomplished (for example to pH 6) when natural waters are mixed with acid. Analogous calculations would show that even a small amount of naturally occurring acidity can account for the majority of the neutralization that is accomplished when natural wastes are mixed with a base.

In addition, it should be noted that in many cases, neutralization can be accomplished by the use of the alkalinity or acidity carried in wastewaters. In these cases, no additional (i.e. "new") water is required, effectively addressing the the Agency's concern about the need to conserve natural resources.

It is irrational to require that the alkalinity (or acidity) of natural waters used for neutralization be increased fractionally only for purposes of avoiding the appearance of diluting when, in fact, chemical reactions can be responsible for much of the pH change even without the addition of alkalinity (or acidity) to such waters. The amount of water to be used in accomplishing pH adjustment (and the necessary concentrations of alkalinity or acidity contained therein) are best determined considering the nature of the waste, the available neutralizing agents, and the costs.

COMMENT NUMBER: 3-D-11
DOCKET NUMBER: LD12-00243
COMMENTER: NCASI
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

Consent Number 3-D-12

Docket Number LD12-00267

Consent Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Submission Dilution

Consent

C. The Prohibition Against "Impermissible Dilution" is Overly Complicated and Makes No Sense in the Context of pH Corrosive Wastes

The preamble goes on at length about the supposed evils of reducing pH to the 6.0 to 9.0 range by dilution rather than by neutralization, and makes it clear that the general prohibition against "impermissible" dilution applies to pH corrosive wastes. As will be discussed more fully later in these comments, the entire concept of "impermissible" dilution is overly complicated, and incapable of rational and predictable application. In the context of pH corrosive wastes, the concept simply makes no sense.

~~Contract Number~~ 3-D-12 continued

~~Docket Number~~ LD12-00267

~~Consent~~ Allied Signal, Inc.

~~Issue~~ D002: Characteristic Corrosive Wastes

~~Subissue~~ Dilution

~~Comment~~

1. Dilution of pH Corrosive Wastes Does Not Increase the Volume of Wastes

EPA's primary argument seems to be that dilution simply creates a larger volume of wastes but does not treat or remove hazardous constituents in the wastes. For pH corrosive wastes, however, there are no hazardous constituents in the waste responsible for the hazardous characteristics. The pH of a liquid is a function of the ratio of hydronium ions to hydroxide ions.² The characteristic of pH corrosivity, then, is not a matter of the presence of a hazardous constituent in the waste, but rather it is a matter of the balance between the hydronium ions and the hydroxide ions. If, as a matter of chemical treatment, or if, as a function of mixing with large volumes of pure water, the ratio between hydronium ions and hydroxide ions is brought into rough balance, then in either case there has been the destruction of the hazardous characteristic.

² Water always contains both hydronium ions and hydroxide ions such that the product of the concentration of these two ions always equals 1×10^{-14} . In other words, when the concentration of hydronium ions is 1×10^{-7} , the concentration of hydroxide ions must also be 1×10^{-7} , and when the concentration of hydronium ions is 1×10^{-6} , the concentration of hydroxide ions must be 1×10^{-8} .

Comment Number 3-D-12 (continued)

Docket Number LD12-00267

Commenter Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comment

2. Neutralization of pH Corrosive Wastes Is Not
More Conservative of Natural Resources Than
Dilution

The preamble also argues that "neutralization is more conservative of natural resources and more protective of aquatic ecosystems." 54 Fed. Reg. 48423. To illustrate the claim that neutralization is more conservative of natural resources,²⁴ EPA compares the amount of pure water that would be required to bring a gallon of concentrated sulfuric acid up to a pH of 7.0, with the amount of lime or caustic that would be required. Dilution would require an incredible 360,000,000 gallons, while neutralization would require 11 or 12 pounds, depending on the neutralizing agent. While the numbers seem impressive, they are largely irrelevant in the real world, and do not in fact support the preamble's assertion that neutralization is more conservative of natural resources than is dilution.

²⁴ The preamble contains no explanation or support for the claim that neutralization is more protective of aquatic ecosystems.

Consent Number 3-D-12 (continued)

Docket Number LD12-00267

Consentee Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

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Consent

Dilution as described by the Agency should not -- and will not -- occur at industrial facilities.²⁴ Treatment by dilution will only occur at industrial facilities by the mixing of various wastewater streams; it will be accomplished by the use of water that is already used by the facility for other purposes. Treatment by dilution will certainly not put any incremental demand on the natural resource (water). Moreover, the quantity of water that will be necessary to effect treatment by dilution is nowhere near the enormous quantity suggested in the preamble.

²⁴ Water and pipes cost money. Piping in hundreds of millions of gallons of water simply to neutralize a gallon of sulfuric acid would never be economically justified. Indeed, this cannot be EPA's real concern. Rather, EPA seems concerned that dilution of pH corrosive wastes is a way around treatment, because EPA has not recognized the difference between pH corrosive waste and wastes that contain hazardous constituents.

Comment Number 3-D-12 (continued)

Docket Number LD12-00267

Commenter Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comment

While the preamble is correct that achieving pH 7.0 by the dilutive effect alone would require an enormous quantity of water, the preamble erroneously assumes that the dilution waters would be distilled water. As long as the water being mixed with the pH corrosive wastes is not distilled or otherwise deionized water, the amount of water required to effect neutralization would be orders of magnitude less than that suggested in the preamble.²⁷ (See discussion below.) From an ecological viewpoint, treatment by dilution, which relies on the commingling of existing wastewater streams, is preferable to lime neutralization, which relies on the exploitation of a natural resource (lime) and results in the generation of sludges requiring land disposal.²⁸

²⁷ For example, assume one has one liter of a pH 2.0 nitric acid solution. If that solution is diluted with one liter of pure water (pH 7.0), the pH of the mixture will be 2.3. However, if the original nitric acid solution is diluted with one liter of a buffer solution, the pH of the mixture will be much higher. For example, if the nitric acid solution is mixed with one liter of a pH 7.0 solution containing hypochlorous acid and hypochlorate ion, the final two-liter mixture will have a pH in the range of 6.98.

²⁸ EPA normally objects to dilution because dilution may merely make it impossible to find the hazard, instead of correcting the hazard. Here dilution is treatment, and should be recognized as such by EPA.

~~Comment Number~~

3-D-12 (continued)

~~Docket Number~~

LD12-00267

~~Comment~~

Allied-Signal, Inc.

~~Issue~~

D002: Characteristic Corrosive Wastes

~~Subissue~~

Dilution

~~Comment~~

3. Dilution of pH Corrosive Wastes Results in Chemical Treatment

In terms of the preamble's discussion of "impermissible" dilution, in almost every case (if not, in fact, every case), the mixing of pH corrosive wastes with other wastewaters will bring about some chemical treatment. While that treatment might not be by "acids" when the corrosive waste is alkaline or by "bases" when the corrosive waste is acidic, as required by the proposed treatment standard, the increase in buffering capacity of the resulting mixture will be chemical treatment nonetheless.

Fortunately, there are well understood methods by which the capacity of even complex industrial effluent streams to effect treatment of acidic or alkaline corrosive wastes can be measured. Standard Method 402 is a test for the "acidity" of a water, which is defined as the water's "quantitative capacity to react with a strong base to a designated pH." *Standard Methods for the Examination of Water and Wastewater*, at 265 (16th. ed. 1985). Similarly, Standard Method 403 is a test for the "alkalinity" of a water, which is defined as the water's "acid-neutralizing capacity." *Id.* at 269. Both acidity and alkalinity are distinct from pH, and most (if not all) moderately acidic industrial effluent streams are likely to have significant alkalinity, and most (if not all) moderately alkaline streams are likely to have significant acidity. Therefore, the mixture of an acidic corrosive stream with even a moderately acidic stream, then, will bring about some real chemical treatment; the pH will not be affected by the dilutive effect alone. The same would hold true with a strong alkaline corrosive stream mixed with a moderately alkaline stream.

~~Consent Number~~ 3-D-12(continued)

~~Docket Number~~ LD12-00267

~~Consent~~ Allied Signal, Inc.

~~Issue~~ D002: Characteristic Corrosive Wastes

~~Subissue~~ Dilution

~~Consent~~

Adjusting pH through the commingling of waste streams is a simple and normal part of a plant's operations. If the mixed stream requires further pH adjustment, this can be achieved through the use of fewer new resources than would be required to neutralize unmixed streams, and possibly through the use of simpler and less capital-intensive facilities. If lime neutralization is required, numerous facilities would be required to incur significant capital costs to replace the existing wastewater treatment systems, to build units capable of handling the unreacted lime and of handling and disposing of the lime sludge generated. Further, to the extent such facilities could not utilize the neutralizing capacity of their other waste streams, they would incur higher operating costs for the lime needed to produce the neutralization previously provided by the other wastes. The costs of sludge handling and disposal would also adversely affect the facilities' operating costs.

At Allied's Hopewell facility, for example, a small but very low pH (less than pH 1.0) stream is initially mixed with two process waste streams in the range of pH 3.0 - 4.0. That combined stream is then combined with a very large process waste stream with a pH typically around 8.0. As a result, the pH of the combined waste stream is brought to a range of pH 4.0-6.0 by commingling. Prior to reaching an equalization basin (at which "land disposal" occurs), the entire waste stream receives caustic neutralization, if necessary.

This method of pH control, which relies primarily on the commingling of various waste streams, represents the method that is most sensible and most conservative of natural resources. The land treatment rules should not make such a sensible scheme impossible.

~~Consent Number~~ 3-D-12 (continued)

~~Docket Number~~ LD12-00267

~~Consent~~ Allied Signal, Inc.

~~Issue~~ D002: Characteristic Corrosive Wastes

~~Subissue~~ Dilution

~~Consent~~

4. EPA's Proposal Will Result in the Generation
of an Increased Amount of Soluble Salts

In many of Allied's plant operations, the potential requirement for individual treatment of acidic and alkaline waste streams will not only significantly and unnecessarily increase the cost of treatment, but will significantly increase the volume of soluble salts generated by such treatment. For example, both spent caustic (sodium hydroxide) and hydrochloric acid waste streams are generated in several of Allied's plants producing halogenated hydrocarbons. These wastes are currently commingled in a centralized NPDES wastewater treatment facility, minimizing the amount of neutralization agents needed for pH control. If the wastes had to be individually treated, up to twice as much soluble salts would be generated. (No insoluble salts can be generated from these chemicals.)

In another case, anionic and cationic ion exchangers are utilized at some Allied facilities to produce deionized process water. These ion exchange beds must be routinely regenerated with hydrochloric acid and sodium hydroxide soaks. Following the soaks, the beds must be rinsed with large volumes of water to thoroughly remove all trace of acid or caustic soda. The corrosive regeneration wastewater is currently neutralized entirely by commingling prior to and in NPDES equalization basins.

~~Comment Number~~ 3-D-12 (Continued)
~~Docket Number~~ LD12-00267.
~~Comment~~ Allied Signal, Inc.
~~Issue~~ D002: Characteristic Corrosive Wastes
~~Subissue~~ Dilution
~~Comment~~

Wastewater entering surface impoundments is nonhazardous at all times.²⁷ If the acidic and alkaline regeneration wastes had to be individually treated to BDAT prior to the surface impoundments, twice as much soluble salt would be generated.

5. Conclusion

For all these reasons, we believe that the concept of "impermissible" dilution has no place in the context of pH corrosive streams, but if EPA persists in its commitment to employ that concept then EPA should explicitly recognize that the mixing of an acidic corrosive waste with any wastewater that has measurable alkalinity (no matter what the pH), or the mixing of an alkaline corrosive waste with any wastewater that has measurable acidity (again, no matter what the pH), constitutes treatment, and therefore does not involve "impermissible" dilution.

²⁷ If EPA promulgates a treatment standard for pH corrosive wastes at a level more stringent than the characteristic level, it should incorporate an exception from such standards for wastewater treatment impoundments where, regardless of the pH of any discharge into the impoundment, the pH along the sides of the impoundments stays within the treatment standard range (e.g., if the proposed treatment standard is promulgated, then that range would be 6.0 to 9.0). This exception would give recognition to the fact that neutralization occurs in such impoundments, and that, if such neutralization takes place prior to the time that the acidic or corrosive material reaches the land boundaries of the impoundment, there can be no adverse effect.

COMMENT NUMBER: 3-D-12
DOCKET NUMBER: LD12-00267
COMMENTER: Allied Signal, Inc.
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

Comment Number

3-D-13

Docket Number

LP12-00267..

Commenter

Allied Signal, Inc.

Issue

D002: Characteristic Corrosive Wastes

Subject

Dilution

Comment

II. The Proposed Treatment Standards for Alkaline and Acidic Corrosive Wastes, and the Concept of Impermissible Dilution as Applied to Such Wastes, Are Arbitrary, Technically Unsupported, and in Many Cases Technically Infeasible

The proposed treatment standard for alkaline and acidic corrosive wastes (D002) is neutralization to the pH range of 6.0 to 9.0, with the generation of insoluble salts. 54 *Fed. Reg.* 48424. While EPA purports to recognize and seemingly to approve neutralization by the commingling of internal waste streams,²⁷ the proposed proscription of neutralization by "impermissible" dilution and the proposed requirement for the generation of insoluble salts as the product of neutralization would effectively prohibit the use of commingling. Moreover, the concept of "impermissible" dilution is so complicated and subject to such widely divergent interpretation that it is worthless as a regulatory principle. Finally, because chemical neutralization and increase in buffering capacity result from commingling, labeling this commingling "impermissible" dilution in the context of corrosive wastes is technically incorrect.

²⁷ "Some facilities generate waste streams which fluctuate from the Acid subcategory to the Alkaline subcategory depending upon what process is used on a given day. These facilities might be able to utilize these fluctuations in pH as a means of performing on-site neutralization." 54 *Fed. Reg.* 48423 (col. 2). See also 51 *Fed. Reg.* 40592 (Nov. 7, 1986) ("In prohibiting dilution as a substitute for adequate treatment, . . . EPA does not intend to disrupt or alter the normal and customary practices of properly operated treatment facilities."); 54 *Fed. Reg.* 26601 (June 23, 1989) ("The Agency realizes and acknowledges . . . that mixing wastes can be a normal part of treatment.").

COMMENT NUMBER: 3-D-13
DOCKET NUMBER: LD12-00267
COMMENTER: Allied Signal, Inc.
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

Comment Number 3-D-14

Docket Number LD12-L0007

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comment

I. The Proposed Treatment Standards for D002 Acid and -
-Alkaline Wastes Are Environmentally Unnecessary and
-Technically Infeasible.

EPA has proposed treatment standards for D002 acid and alkaline wastes that require neutralization to a pH of 6 to 9 using agents that form insoluble salts. 54 Fed. Reg. at 48,422. The Agency's rationale for these proposed standards include: (1) hydronium ions may solubilize metals from clay liners; (2) hazardous constituents in ground waters may be mobilized by pH values below 6 or above 9; (3) this pH range matches the buffering capacity of natural systems; (4) and soluble salts, if improperly managed, could adversely impact fresh water systems. As will be discussed in the following subsection and again in Section XVI with respect to injected wastes, EPA has not conducted a thorough technical analysis of its assumptions, and its proposed standards for D002 alkaline and acid wastes are not only technically infeasible for some wastes, but also may cause adverse environmental impacts.

Comment Number

3-D-14 (continued)

Docket Number

LD12-L0007.

Commenter

CMA

Issue: D002: Characteristic Corrosive Wastes

Subissue: Dilution

Comment

3. EPA's Concerns About Dilution With Water Are Misplaced.

While CMA has no problem with EPA specifying neutralization as a technology for acid and alkaline hazardous wastes, EPA's rationale for this treatment designation, which discusses "dilution" with water, is technically unfounded. EPA's example of dilution is based on the assumption that the dilution water is free of all ions with the exception of hydronium and hydroxyl ions; i.e., completely deionized water. This will require a waste treater to first deionize water (at great cost), and then use it to dilute a corrosive waste, a method that is not practiced in the treatment industry because it is cheaper to neutralize the waste with a buffering agent. In actuality, any water added to a corrosive waste will contain some ionic species, which will react with the acid or base in the waste. In other words, any real-world addition of water to a corrosive waste will involve some degree of neutralization; not dilution as EPA's example implies. This concept is of concern to CMA since in many cases wastewaters, or wastewaters and solid wastes, with different amounts of acidity and alkalinity are comingled for neutralization. This is not dilution, and should not be characterized as such.

EPA should explicitly permit and encourage aggregation of wastes of varying pH to achieve co-neutralization. To require otherwise violates principles of pollution prevention and resource conservation since additional neutralizing agents will be used to achieve the required pH range.

... Comment Number 3-D-14 (continued)

Docket Number LD12- L0007.

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comment

2. EPA Should Encourage Mixing Acidic Wastes with Alkaline Wastes as Treatment for Corrosivity.

EPA recognizes that facilities that generate both an acidic and alkaline waste may be able to use the fluctuations in pH as a means of performing on-site neutralization (54 Fed. Reg. 48423212). This mixing constitutes permissible dilution and results in the minimum formation of wastewater and salts. For example, facilities that demineralize water for boiler feed water typically regenerate the ion exchange beds creating an acidic and an alkaline wastewater. Combining these to neutralize the streams avoids the need to use additional acidic or alkaline solution which, if added, will increase the overall volume of wastewater and sludges generated. The Agency should encourage the mixing of wastewater streams to reduce the addition of chemicals needed to neutralize D002 waste and should confirm that such aggregation is legitimate treatment and does not constitute impermissible dilutions.

Consent Number 3-D-14 (continued)

Docket Number LD12-L0007.

Consent CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Dilution

Comment

As EPA has recognized, dilution is necessary in some cases for treatment of D002 Acid and Alkaline Subcategory wastewater to provide a health sink to control very exothermic reaction or toxic air emissions (54 FR 48423/2). Allowing aggregation in a centralized treatment unit will minimize the volume of wastewater generated compared to segregating the concentrated D002 wastewater and adding water to control the exothermic reaction. Roughly three quarters of CMA member company wells that inject hazardous waste blend one or more waste stream(s) that are corrosive prior to mixing. SCS Survey at B-10. For almost half of these wells, the corrosive characteristic is eliminated prior to injection, and 27 percent of these have achieved that result by blending individual streams with varying pH levels to treat through co-neutralization. Id. at B-14. Such co-neutralization of waste streams should be permitted and encouraged.

COMMENT NUMBER: 3-D-14
DOCKET NUMBER: LD12-L0007
COMMENTER: CMA
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

Comment Number: 3-D-15

Docket Number: 2010-00048

Commenter: The Dow Chemical Company

Issue: 0002 - Characteristic Corrosive Wastes

Subissue: Dilution

Comment:

EPA says in the proposal:

[I]t is currently conducting laboratory analysis of a waste which exhibits the characteristic of corrosivity that falls in the Other Corrosives Subcategory. This waste is a spent catalyst which contains a high level of ferric chloride suspended in a chlorinated organic phase. The Agency is conducting tests to chemically deactivate the waste through dilution to the point where it no longer corrodes steel.

This waste appears to be very similar to a waste generated at a Dow Texas Operations facility which recently provided samples to an EPA contractor. In the late 1970s research was begun to treat this stream in a manner similar to that described by EPA. However, the stream produced a gel in contact with water under a wide variety of conditions:

- 1) high and low pH,
- 2) various temperatures and
- 3) varying water-to-organic concentrations.

The resulting gel was unpumpable and work was terminated on water treatment for this waste. It was felt that four-carbon compounds produced in the process were polymerizing to cause the problem.

COMMENT NUMBER: 3-D-15
DOCKET NUMBER: LD10-00048
COMMENTER: The Dow Chemical Company
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

Comment Number: 3 - D - 16
Docket Number: 2010 - 00028
Commenter: DOE
Issue: D002 - Characteristic Corrosive Waste
Subissue: Dilution
Comment:

54 FR 1095, D002 Corrosive Wastes

DOE strongly supports the approach considered by EPA for developing treatment standards for corrosive wastes through "No Land Disposal Based on Neutralization" (or "No Land Disposal Based on Deactivation" for the Other Corrosives subcategory). Such a standard will allow appropriate flexibility to generators, particularly to mixed waste generators, in the treatment of corrosive wastes.

DOE feels that EPA may have made an error in stating that a variance from neutralization could be necessary "for D002 wastes which for some reason or another could not be effectively neutralized." Based upon the language in the paragraph preceding the statement, EPA will allow dilution as an acceptable treatment for corrosive wastes; neutralization per se is not required. Since "No Land Disposal Based on Neutralization" does not preclude dilution as a treatment method, a variance should not be required for treatment of wastes defined by the corrosivity characteristic via dilution. DOE feels that a more appropriate phrasing of the statement in question would be that a variance could be considered "for D002 wastes which for some reason or another could not be effectively treated." DOE requests clarification regarding this interpretation, i.e., that a variance would only be required if treatment (by neutralization or dilution) cannot be performed.

COMMENT NUMBER: 3-D-16
DOCKET NUMBER: LD10-00028
COMMENTER: DOE
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

Comment Number: 3-D-17

Docket Number: LD10-00031

Commenter: HWTC

Issue: D002-Characteristic Corrosive Wastes

Subissue: Dilution

Comment:

D002 Corrosive Waste

For D002 waste in the acid and alkaline subcategories, numeric treatment standards based on pH levels should be established. Even if these performance levels are set at 2.0 and 12.5, it is important to define performance levels, as just declaring neutralization as a standard is too vague.

The HWTC strongly disagrees with EPA on page 1096 that dilution is an acceptable treatment option for corrosive waste, particular those in the "other corrosives" subcategory which include organic corrosives. Dilution is clearly a violation of the statutes for the land disposal restrictions, and EPA must not take this clearly unlawful approach. Dilution also discourages waste minimization.

A numeric pH BDAT performance treatment standard would work for all corrosives subcategories. Even if the corrosive material is an organic, the performance level would require that all treatment residuals, wastewater or nonwastewater, meet the pH standards. Thus if an organic corrosive is incinerated, the ash and scrubber water residuals would have to be within the pH limits specified by the treatment standard. Incineration or thermal destruction must be included as appropriate treatment technologies for corrosive wastes since for organic corrosives no other technologies can be applied to eliminate the characteristic.

COMMENT NUMBER: 3-D-17
DOCKET NUMBER: LD10-00031
COMMENTER: HWTC
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

Comment Number: 3-D-18
Docket Number: LD10-00034
Commenter: CMA
Issue: D002-Characteristic Corrosive Waste
Subissue: Dilution
Comment:

EPA requests comments on a proposal to ban from land disposal D002 wastes (both acidic and alkaline subcategories) on the basis of neutralization.

CMA supports the Agency's position that it cannot establish a numerical standard for these D002 wastes based exclusively on what neutralization will achieve. The Agency states that it considered requiring neutralization to a pH between 6 and 8.5. The Agency rightfully dropped this requirement, noting that when a waste has a pH above 2.0 and below 12.5 it is no longer a D002 waste.

The Agency is correct in its explanation that dilution is an acceptable means of removing a characteristic from a waste. The Agency expresses concern that "copious quantities" of materials may be needed for neutralization. CMA notes, however, that dilution is always an element of the neutralization process. The act of neutralization always dilutes a waste with an acid or alkali. The quantity of acid or alkali is immaterial. For example, in a manufacturing process, it is proper, common and economical to use relatively large amounts of readily available weak acids to neutralize relatively small amounts of strong alkalis.

COMMENT NUMBER: 3-D-18
DOCKET NUMBER: LD10-00034
COMMENTER: CMA
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Dilution

EPA is not prohibiting the mixing of nontoxic D002 alkaline and acid wastes to achieve neutralization. The Agency recognizes that "dilution" occurs in normal operation of an NPDES wastewater treatment plant and that prohibition of dilution would cause drastic and costly changes in wastewater treatment facilities.

COMMENT NUMBER:

3-E-1

DOCKET NUMBER:

LD12-00081

COMMENTS:

EnviroSafe Management Services Inc
D002-Characteristic Corrosive Wastes
miscellaneous wastes

ISSUE:

SUBISSUE:

COMMENT:

EPA is indicating that for certain D002 corrosive wastes, a treatment or disposal facility must test the material. This test for corrosion of steel for non-pH dependent corrosive materials is one that EPA cites is very difficult to do if it can be done at all. In

fact, the wording in the Preamble is that this may be in part due to high costs of testing and the difficulties in identifying laboratories that are experienced in steel corrosion testing. It is difficult to understand how we will be able to implement these treatment standards for non-pH dependent corrosive materials if there is no measure to determine whether or not we have completed the treatment process.

COMMENT NUMBER: 3-E-1
DOCKET NUMBER: LD12-00081
COMMENTER: EnviroSAFE Management Services, Inc.
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues

EPA has established a standard of "Deactivation to Remove the Characteristic of Corrosivity" for wastes in the D002 other corrosives subcategory to allow the regulated community the flexibility to use the best technology. A test method does exist for steel corrosion testing and can be used to determine when a treatment process has been completed. The Agency recognizes the difficulties involved with testing but believes that a D002 other corrosive waste must be tested to show that the characteristic of corrosivity has been removed before land disposal.

Comment Number: 3 - E-2

Docket Number: 4010-00020

Commenter: SOCMA

Issue: 0002 - Characteristic Corrosive Wastes

Subissue: Miscellaneous Issues

Comment:

Docket No. F-89-LD100-FFFFP
February 27, 1989
Page 7

3. Specific Comments

SOcMA supports EPA's proposals regarding Ignitable (0001) and Corrosive (0002) wastes. We strongly agree with the Agency's assessment that requiring analysis of individual components of ignitable wastes would impose unnecessary and burdensome testing and certification on the regulated community.

COMMENT NUMBER: 3-E-2
DOCKET NUMBER: LD10-00020
COMMENTER: SOCMA
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues

The Agency appreciates this commenter's support with regard to the unnecessary burden of testing and certification that would be created if numerical treatment standards are developed for D001 and D002. Since EPA would probably have to regulate the entire list of BDAT constituents since the compounds in these wastestreams are so diverse.

Comment Number: 3-E-3

Docket Number: LD10-00037

Commenter: Cyanamid

Issue:

D002-Characteristic Corrosive Waste

Subissue:

Miscellaneous issues

Comment:

Treatment Standards for Characteristic Wastes (34 FR 1093-1100)

In general we support the Agency's proposals regarding Ignitable (D001) and Corrosive (D002) wastes. We particularly agree with EPA's assessment that requiring individual component analysis of Ignitable wastes would create an unnecessary burden of testing and certification for the regulated community.

COMMENT NUMBER: 3-E-3
DOCKET NUMBER: LD10-00037
COMMENTER: Cyanamid
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues

The Agency appreciates this commenter's support with regard to the unnecessary burden of testing and certification that would be created if numerical treatment standards are developed for D001 and D002. Since EPA would probably have to regulate the entire list of BDAT constituents since the compounds in these wastestreams are so diverse.

Comment Number: 3-E-4

Docket Number: LD10-40009

Commenter: ATSWMO

Issue: D002-Characteristic Corrosive Wastes

Subissue: Miscellaneous Issues

Comment:

o D002 Corrosive Wastes

The proposal for D002 Corrosive Wastes only addressed aqueous and liquid wastes. There are nonliquid wastes that are corrosive and it is unclear if the methods of treatment for aqueous and liquid corrosive wastes are applicable to treat nonliquid corrosive wastes. USEPA should address the applicability of treatment methods for nonliquid wastes that are corrosive.

COMMENT NUMBER: 3-E-4
DOCKET NUMBER: LD10-L0009
COMMENTS: ATSWMO
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues

The Agency received many comments regarding nonliquid wastes that are corrosive and the applicability of treatment technologies for aqueous and liquid corrosive wastes to treat nonliquid corrosive wastes. The proposal did not specifically address corrosive solids because there is not a definition of corrosive solids in Section 261.22 at this time. Until the Agency amends Section 261.22 to include a definition for corrosive solids and promulgates a treatment technology, generators must prudently handle wastes with regard to known hazards. Although not required under current regulations, many generators of corrosive solids prefer to classify these wastes as D002 corrosives and choose waste management and disposal protocols accordingly in an added effort to protect the environment.

COMMENT NUMBER: 3-E- 5
DOCKET NUMBER: LD12-00159
COMMENTS: Waste Management, Inc./Chemical Waste Management, Inc.
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: *Miscellaneous Issues*
COMMENT:

ii. Other Corrosives

The Agency indicates in the preamble that difficulty exists when documenting the corrosion rate for certain waste streams and speculates that some generators may apply knowledge to establish the corrosive nature of the material. 54 Fed. Reg. at 48,424. As the Agency points out, the SAE 1020 Steel Corrosion Rate of less than 6.35 mm/yr will be difficult and time consuming to demonstrate by TSD facilities. *Id.* This could result in potentially months of testing delays. For example, treatment of a ferric chloride solution with a pH of 3-4 would require a 24-hour coupon test on the filtrate to verify that the standard was met.

WMI therefore proposes that EPA express the treatment standards for these wastes as treatment methods. The best way to treat inorganic "other corrosives" is through base neutralization or incineration. Therefore, the treatment standard for these wastes should be expressed as: "Neutralization/precipitation with a Base or Incineration." A further discussion of incineration of corrosive wastes follows.

COMMENT NUMBER: 3-E-5
DOCKET NUMBER: LD12-00159
COMMENTER: Waste Management, Inc./Chemical Waste
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues

EPA has established a standard of "Deactivation to Remove the Characteristic of Corrosivity" for wastes in the D002 other corrosives subcategory to allow the regulated community the flexibility to use the best technology. A test method does exist for steel corrosion testing and can be used to determine when a treatment process has been completed. The Agency recognizes the difficulties involved with testing but believes that a D002 other corrosive waste must be tested to show that the characteristic of corrosivity has been removed before land disposal.

...
Comment Number 3-E-6

Docket Number LD12-00172..

Commenter HWTC

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Miscellaneous Issues

Comment:

Also in setting the standard, EPA must clarify the definition of liquid as to rather the paint filter test applies, or Method 1310 or 9096. EPA shou'd review a Memorandum No. 29 dated 10/24/89 of David Friedman, Chief, Methods Branch, U.S EPA, regarding the definition in clarifying this crucial issue in the final third thirds rule.

COMMENT NUMBER: 3-E-6
DOCKET NUMBER: LD12-01729
COMMENTER: HWTC
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues

While the Agency has defined liquids as materials expressed from wastes in Step 2 of Method 1310 (EP), and Methods 9095 and 9096, there is not a specific definition in the regulations. Therefore, the generator of a potentially ignitable liquid waste may use any liquid determination method for which he can provide an appropriate scientific or technical justification.

....
Comment Number 3-E-7

Docket Number LD12-L0007.

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Miscellaneous Issues

Comment

In particular, the proposed BDAT for D002 corrosive waste conflicts with the Agency's own pollution prevention policy by limiting concentration, encouraging the use of potentially hazardous treatment reagents such as silver and barium, and increasing the amount of materials requiring land disposal.

COMMENT NUMBER: 3-E-7
DOCKET NUMBER: LD12-L0007
COMMENTER: CMA
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues

EPA has established a standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 corrosive wastes. This standard does not force treatment with reagents such as silver and barium, and does not cause an increase in the amount of materials requiring land disposal since the insoluble salt requirement has not been finalized.

Comment Number

3-E-8

Docket Number

LD12-10028

Commenter

Cyanamid

Issue: D002: Characteristic Corrosive Wastes

Subissue: Miscellaneous Issues

Comment

In the absence of an approved petition, the currently proposed, "third-third" land ban regulations would compel the Cyanamid Fortier plant to cease injection of several major wastewater streams and curtail production on May 8, 1990. The affected streams and their quantities are delineated below.

1. D002 (low pH) nonwastewaters - This stream which arises principally from the manufacture of methyl methacrylate, consists of approximately 42 million gallons per year of spent (30%) sulfuric acid, with a TOC level of more than 1%. Inexplicably, the proposed "third-third" land ban rule makes no technical distinction between D002 "wastewaters" and "nonwastewaters" while proposing to grant a nationwide capacity variance for injected wastewaters, but not for nonwastewaters.

COMMENT NUMBER: 3-E-8
DOCKET NUMBER: LD12-L0028
COMMENTER: Cyanamid
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues

The Agency received many comments regarding nonliquid wastes that are corrosive and the applicability of treatment technologies for aqueous and liquid corrosive wastes to treat nonliquid corrosive wastes. The proposal did not specifically address corrosive solids because there is not a definition of corrosive solids in Section 261.22 at this time. Until the Agency amends Section 261.22 to include a definition for corrosive solids and promulgates a treatment technology, generators must prudently handle wastes with regard to known hazards. Although not required under current regulations, many generators of corrosive solids prefer to classify these wastes as D002 corrosives and choose waste management and disposal protocols accordingly in an added effort to protect the environment.

COMMENT NUMBER: 3-E-9
DOCKET NUMBER: LD12-00138
COMMENTER: Occidental Chemical Corporation
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: MISCELLANEOUS ISSUES
COMMENT:

The Agency has neglected to consider the fact that acid and alkaline wastes that require neutralization often contain many organic and inorganic constituents. The wastes may contain hazardous metals and toxic organic constituents. The sludges resulting from neutralization may be hazardous, or they may not be hazardous but may contain hazardous constituents. In the case of organic constituents, neutralization is often used to prepare the wastewater for steam/air stripping, biological treatment, or carbon adsorption, all of which will remove the organics. If a sludge is formed in the neutralization process, organic constituents that could have been destroyed by biodegradation or removed by stripping or adsorption are instead being transferred to the solid phase, where they will be either disposed of untreated or where they may require that the solids be incinerated before they can be disposed. EPA's apparent preference for transferring organic constituents that are readily treatable in wastewater to a solid, where they may be disposed of without treatment or where they will require much more expensive treatment (incineration, which will require the use of fuel) is contrary to the intent of RCRA, even though the agency implies otherwise. Also, recovery, as suggested by EPA, would be impractical for the vast amount of precipitates resulting from the neutralization of wastewaters, because the presence of contaminating constituents (metals and organics) would require treatment that is likely to be far more expensive than purchasing fresh precipitating agents (typically calcium oxide).

The Agency has provided no rational technical or scientific basis for its proposed standards for acid and alkaline corrosive wastes (D002). Its stated reasons for the proposed standards are contrived and cannot be justified. EPA should set standards for alkaline and acid corrosive wastes at the current characteristic limits; this is the only environmentally and technically justifiable approach for the extremely diverse wastes that compose this subcategory of D002 wastes.

COMMENT NUMBER: 3-E-9
DOCKET NUMBER: LD12-00138
COMMENTER: Occidental Chemical Corporation
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

The Agency agrees with the points made by this commenter. The Agency realizes that in many cases for D002 wastes that contain organics, neutralization is often a necessary pretreatment step for other treatment processes that remove or destroy the organics. If a sludge is formed during the neutralization process, organics may precipitate and be transferred to the solid phase where they will be either disposed of untreated or where they may require treatment by incineration. If however, those organic sludges exhibit a characteristic i.e., TC toxicity, then they must still be treated to the appropriate regulatory level.

The Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 acid and alkaline wastes. This standard will give the regulated community the flexibility needed to treat the wide diversity of D002 acid and alkaline wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number: 3-E-10

Docket Number: LD12-00138

Commenter: Occidental Chemical Corporation

Issue: D002 - Characteristic Corrosive Wastes

Subissue: Miscellaneous Issues

Comment:

- E. The Agency Has Proposed Recovery as a Method of Treatment for Acid and Alkaline Hazardous Wastes (D002). However, the Preamble Does Not Discuss Alkaline Waste Recovery. EPA Should Make It Clear in the Preamble That Recovery Is an Acceptable Treatment Method for Both Acid and Alkaline Wastes.

At 54 Fed. Reg. 48423, EPA discusses the recovery of acid wastes, but says virtually nothing about alkaline wastes. The proposed standards, however, are written to cover both types of corrosive wastes. OxyChem supports the designation of recovery as an acceptable BDAT treatment for both acid and alkaline wastes.

COMMENT NUMBER: 3-E-10
DOCKET NUMBER: LD12-00138
COMMENTS: Occidental Chemical Corporation
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

The Agency thanks the commenter for its support of recovery as a viable treatment option. Recovery is a BDAT option for both D002 acids and alkalines. Recovery options have been demonstrated for a variety of corrosive wastes. The Agency prefers recovery as a treatment standard, in that it results in no discharge of acidic or alkaline constituents into the environment and conserves resources. The legislative history of the land disposal restrictions also indicate that recovery is the preferred management alternative. The Agency lacks waste characterization data which indicates the wastes that are most amenable to recovery; therefore, the choice between treatment and recovery may be made by the generator or the centralized treatment operation, according to the applicability and performance of a given type of acid/base recovery system.

COMMENT NUMBER: 3-E-11
DOCKET NUMBER: LD12-00143
COMMENTER: General Motors Corporation
ISSUE:
SUBISSUE: D002-Characteristic Corrosive Wastes
COMMENT: Miscellaneous Issues

Deactivation as a Treatment Standard

GM agrees that if deactivation is promulgated as a method of treatment for certain subcategories of D001, D002, and D003 wastes (page 48419), rather than treatment to achieve the existing characteristic levels, the actual method of deactivation for each waste can best be determined by the generator or the treater.

COMMENT NUMBER: 3-E-11
DOCKET NUMBER: LD12-00143
COMMENTER: General Motors Corporations
ISSUE: D002 Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

The Agency is promulgating "Deactivation to Remove the Characteristic" for the following subcategories: D001-ignitable liquids low TOC nonwastewaters, D001-ignitable liquids wastewaters, D001-ignitable reactives, D001-oxidizers, D002-other corrosives, D003-sulfides, D003-explosives, and D003-water reactives and other D003 reactives. See 40 CFR Section 268 Appendix VI for a list of applicable technologies that used alone or in combination can achieve this standard. Because of the diversity of wastes and applicable treatment technologies, the Agency believes that generators and treaters are best suited to select which treatment technology is best to remove the characteristic of these wastes.

Comment Number: 3-E-12

Docket Number: LD12-00003

Commenter: Recontck

Issue: Characteristic Corrosive Wastes

Subissue: Miscellaneous Issues

Comment:

Further, in the matter of metal bearing waste residues specifically from D002 and D003 wastes, we believe that no exemption should be granted since all of these materials can be recycled for their metal values. Once the metal values have been recycled, there is no longer a reason to consider the wastes hazardous because its characteristic content, the heavy metals, have been removed.

COMMENT NUMBER: 3-E-12
DOCKET NUMBER: LD12-00003
COMMENTER: Recontek
ISSUE: D002 Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

A metal-bearing waste residue from the treatment of a D002 or D003 waste would only be considered hazardous if the metal concentration was above one of the EP toxic levels (i.e., D004-D011). In such a case, the residue would be subject to the nonwastewater treatment standard of the metal "D" code. Recovery is a BDAT option for the metal "D" codes.

The Agency agrees with the commenter, so long as the residual streams from the recovery process no longer exhibit the characteristic level of toxicity.

COMMENT NUMBER: 3-E -13
DOCKET NUMBER: LD12-00151
COMMENTS: Gulf Coast Waste Disposal Authority
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
COMMENT:

F. The sludges that would be generated if all D002 wastes were neutralized to form precipitates would be difficult to manage, and would present far more potential for environmental risk than the discharge of soluble inorganic salts.

The Agency has neglected to consider the fact that acid and alkaline wastes that require neutralization often contain many organic and inorganic constituents. The wastes may contain hazardous metals and toxic organic constituents. The sludges resulting from neutralization may be hazardous, or they may not be hazardous but may contain hazardous constituents in low concentrations. In the case of organic constituents, neutralization is often used to prepare the wastewater for steam/air stripping, biological treatment, or carbon adsorption, all of which will remove the organics. If a sludge is formed in the neutralization process, organic constituents that could have been destroyed by biodegradation or removed by stripping or adsorption are instead being transferred to the solid phase, where they will be either disposed of untreated or where they may require that the solids be incinerated before they can be disposed of. EPA's apparent preference for transferring organic constituents that are readily treatable in wastewater to a solid, where they will be disposed of without treatment or where they will require much more expensive and not necessarily more environmentally sound treatment (incineration, which will require the use of fuel and will result in the emission of carbon dioxide and nitrogen oxides), is contrary to the intent of RCRA, even though the Agency implies otherwise. Also, recovery, as suggested by EPA, would be impractical for many precipitates resulting from the neutralization of wastewaters, because the presence of contaminating constituents (metals and organics) would require treatment that is likely to be far more expensive than purchasing fresh precipitating agents (typically calcium oxide).

COMMENT NUMBER: 3-E-13 (continued)
DOCKET NUMBER: LD12-00151
COMMENTER: Gulf Coast Waste Disposal Authority
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
COMMENT:

An example of the adverse effects of EPA's proposed treatment standard for D002 wastes is the treatment system at GCA's Washburn Tunnel Facility (WTF). Currently, the WTF neutralizes 1 million gallons per day (MGD) of a chemical plant wastewater with a pH of 1.5 with up to 30 MGD of high pH pulp and paper mill wastewater. Only a small amount of lime is needed to control the pH of the resulting mixture to 5.5. The pH is controlled at 5.5, since it rises during subsequent treatment to above pH 7. The biologically treated effluent is discharged to the Houston Ship Channel, a brackish water body connected to Galveston Bay. Although the major treatment units at the WTF are tanks and thus the wastewaters would not be subject to the land disposal restrictions when they are treated, the facility does have surface impoundments that could be used for emergency waste storage. Under the proposed BDAT standards for D002 wastes, GCA would not have this emergency treatment available, and noncompliance with the NPDES permit would be a possible result.

If EPA's treatment standard for D002 acid and alkaline wastes is promulgated as proposed, GCA could have to separately neutralize the chemical plant wastewater to maintain its ability to provide emergency treatment, using lime to raise the pH and precipitate calcium sulfate. Acid would then have to be added to the influent to the aeration basin to lower it to pH 5.5, due to the subsequent rise in pH that occurs during treatment. This treatment redundancy (raising the pH of the acid stream to 6 with a base, followed by adjustment of the mixed wastes with acid to pH 5.5) is counterproductive to the principles of resource conservation and pollution prevention.

It is estimated that neutralization would require approximately 5 tons per day of calcium hydroxide and would generate about 9 tons per day (dry weight) of calcium sulfate sludge. The total additional amount of sludge (wet weight) that would be collected in the primary clarifiers at the WTF would be 150 tons per day at 6.0 percent solids in the clarifier underflow. This large additional volume of solids would not only tax the capacity of the primary clarifiers and solids handling system, it would also unnecessarily use valuable landfill capacity. It is not possible to recycle the sludge, since it would be a mixture of the wood pulp and organic and inorganic suspended solids discharged by other WTF customers. The solids would also contain adsorbed

COMMENT NUMBER: 3-E-13 (Continued)
DOCKET NUMBER: LD12-00151
COMMENTER: Gulf Coast Waste Disposal Authority
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
COMMENT:

organic constituents, which would otherwise be removed by the activated sludge process. Even if a completely separate neutralization and sedimentation system were installed for the chemical plant wastewater, which would involve great expense and result in treatment unit redundancy at the WTF, the calcium sulfate solids would probably still not be recyclable because of the adsorbed organics from the wastewater. GCA doubts that any lime recalciner would be willing to accept this sludge, and 9 tons/day is too small an amount to make on-site recalcining cost-effective.

To implement this program, the WTF would have to substantially increase the capacity of the lime storage and feeding facilities, and add equipment to store and feed acid. This would require the handling of either sulfuric or hydrochloric acid, both of which are hazardous chemicals. This would increase work place risks and the potential for environmental impacts due to spills compared to the existing operations, even though GCA would use state-of-the-art handling and storage procedures. Thus, separate neutralization of the corrosive wastewaters at the WTF as is proposed for D002 wastes would increase the complexity of operation, the costs, and the environmental and human health risks compared to the current operations. This situation can in no way be considered additional minimization of risks to human health and the environment.

This example shows the counterproductive effect of EPA's proposed treatment standards for D002 acid and alkaline wastes. At the WTF, which is not unique in this respect, it would increase sludge generation and chemical use and would provide no environmental benefit.

COMMENT NUMBER: 3-E-13
DOCKET NUMBER: LD12-00151
COMMENTER: Gulf Coast Waste Disposal Authority
ISSUE: D002 Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

The Agency agrees with the points made by this commenter. The Agency realizes that in many cases for D002 wastes that contain organics, neutralization is often a necessary pretreatment step for other treatment processes that remove or destroy the organics. If a sludge is formed during the neutralization process, organics may precipitate and be transferred to the solid phase where they will be either disposed of untreated or where they may require treatment by incineration. If however, those organic sludges exhibit a characteristic i.e., TC toxicity, then they must still be treated to the appropriate regulatory level.

The Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 acid and alkaline wastes. This standard will give the regulated community the flexibility needed to treat the wide diversity of D002 acid and alkaline wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

COMMENT NUMBER: 3-E-14
DOCKET NUMBER: LD12-00164
COMMENTER: Institute of Chemical Waste Management
ISSUE: D002-Characteristic Corrosive Wastes
SUBISSUE: *Miscellaneous Issues*
COMMENT:

DEACTIVATION

The Agency is proposing deactivation as the treatment standard for D001, D002 and D003 waste codes. In addition, the Agency is asking for comment on whether to allow other methods. The Institute previously has taken the position that LDR standards should allow the use of a variety of treatment methods. Therefore, the Institute would support the Agency proposal to specify thermal destruction, incineration, chemical oxidation, chemical reduction, or controlled reaction with water as treatments for these waste codes.

COMMENT NUMBER: 3-E-14
DOCKET NUMBER: LD12-00164
COMMENTER: Institue of Chemical Waste Management
ISSUE: D002 Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

EPA agrees with the commenter that incineration, chemical oxidation, chemical reduction and controlled reaction with water are potential deactivation technologies. See 40 CFR Section 268 Appendix VI for a list of applicable technologies that used alone or in combination can achieve the standard for each subcategory where "deactivation" is the promulgated treatment standard.

Comment Number 3-E-15

Docket Number LD12-00179

Commenter Dow Chemical

Issue D002-Characteristic Corrosive Wastes

Subissue Miscellaneous Issues

Comment

XXVII. TREATMENT OF CORROSIVE HAZARDOUS WASTES.

54 Fed. Reg. 48,424 column 2

EPA has proposed technology standards for D002 hazardous wastes, with specific treatment technologies. As has been previously discussed, the pH range for BDAT standards should be set at the current range of hazard characteristic, pH 2-12.5. EPA should emphasize that any treatment technology which reaches the BDAT standards for corrosive hazardous wastes is acceptable. The treatment technologies mentioned include neutralization, recovery and deactivation. Incineration is another treatment technology routinely used for corrosive hazardous wastes. Dow recommends a true treatment standard set at the level of characteristic for this waste. Many treatment technologies can be used to remove the corrosivity. These should be allowed.

COMMENT NUMBER: 3-E-15
DOCKET NUMBER: LD12-00179
COMMENTER: Dow Chemical
ISSUE: D002 Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

The Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. The Agency believes that this standard will give the regulated community the flexibility to select the "best" technology for a specific D002 waste stream. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number 3-E-16

Docket Number LD12-00189.

Commenter DuPont

Issue D002- Characteristic Corrosive Wastes

Subissue Miscellaneous Issues

Comment

C. LABORATORY CORROSIVE WASTES

Du Pont operates certain laboratory operations in which materials meeting the corrosive characteristics are used as disinfection agents for infectious wastes. For example, hypochlorite or caustic solutions may contain syringes or other infectious wastes.

The Agency has solicited comment on situation where D002 wastes may not be amenable to neutralization or recovery. Du Pont submits that the above situation is one such example.

COMMENT NUMBER: 3-E-16
DOCKET NUMBER: LD12-00189
COMMENTER: Dupont
ISSUE: D002 Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

The Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for all D002 wastes. The Agency believes that this standard will give the regulated community the flexibility to select the "best" technology for a specific D002 waste stream. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

The Agency believes that incineration could achieve the treatment standard for the waste stream described by this commenter

... Consent Number 3 E-17

Docket Number LD12-00206..

Consent University of Washington

Issue D002: Characteristic Corrosive Wastes

Subissue Miscellaneous Issues

Comments

2. Definition of deactivation and verification of complete treatment. We support the general concept of specifying "deactivation as a method" for a treatment standard for certain D001, D002 and D003 categories of waste. However, we foresee certain problems with this method related to the vagueness of the term. For example, in the case of a D001 oxidizer, one form of deactivation would be chemical reduction. By what criteria will facilities determine when the waste is adequately reduced (i.e. deactivated)? The same problem holds true for D003 explosives, water reactives, and other reactives.

COMMENT NUMBER: 3-E-17
DOCKET NUMBER: LD12-00206
COMMENTER: University of Washington
ISSUE: D002 Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

EPA agrees with the commenter that guidance should be given to help the regulated community understand what is meant by "deactivation." In the case of an oxidizer, if the waste is treated so that it produces a treated waste residual that is no longer capable of yielding oxygen and stimulating combustion, then the material no longer exhibits the characteristic of ignitibility and hence no longer meets the definition of a D001 oxidizer. The Agency suggests using a surrogate to determine when the chemical reduction process is complete.

EPA has developed a list of applicable technologies for each subcategory where "deactivation" is the promulgated standard. See 40 CFR Section 268 Appendix VI for a list of technologies that can achieve the "deactivation" standard.

~~Comment Number~~ 3-E-18

~~Docket Number~~ LD-2-00255

~~Comment~~ Ensign-Bickford Industries, Inc.

~~Issue~~ D002: Characteristic Corrosive Wastes

~~Subissue~~ Miscellaneous Issues

~~Comment~~

Gentlemen:

This letter is written to comment on your proposed rule for Land Disposal Restrictions for Third Scheduled Wastes. My concern is with the proposed treatment standards for ignitable, corrosive, and reactive wastes and specifically reactive characteristic wastes.

I am in support of the Deactivation Treatment Standard and agree with EPA's statement that

... the actual method of "Deactivation" chosen for each waste may be best determined by the generator or the treater most knowledgeable as to the waste's unique hazards and handling.

This is a reasonable approach and recognizes that the industry's primary safety concern is to render these materials non-reactive. It also recognizes that flexibility is needed in that one method of treatment is not appropriate for all wastes.

I am concerned, however, that "open burning" is conspicuous by its absence in the language of the preamble. In the preamble, examples of deactivation are given several times such as:

...deactivation (e.g. open detonation, thermal destruction, specialized incineration, chemical oxidation, chemical reduction, and controlled reaction with water).

and,

... the Agency is allowing the regulated community to use the treatment technology (e.g. incineration, chemical deactivation) that best fits the type of explosive waste.

It is not clear anywhere that open burning is an option, although "thermal destruction" may be interpreted to mean or include open burning.

COMMENT NUMBER: 3-E-18
DOCKET NUMBER: LD12-00255
COMMENTER: Ensign-Bickford Industries, Inc.
ISSUE: D002 Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

The Agency thanks the commenter for his support of a deactivation standard. The Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 acid and alkaline wastes. This standard will give the regulated community the flexibility needed to treat the wide diversity of D002 acid and alkaline wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

Comment Number 3-E-19

Docket Number L012-00267

Commenter Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Miscellaneous Issues

Comment

D. The Final Rule Should Specify That BDAT Does Not Require 100 Percent Compliance For pH That is Continuously Monitored

The Agency should clarify in the final rule that the BDAT standard for acidic and alkaline corrosive wastes does not require 100 percent compliance with the pH standard for waste streams that are continuously monitored for pH.

Under the NPDES program, permittees that continuously monitor for pH are required to comply with the applicable pH limitations only 99 percent of the time. 40 C.F.R. § 401.17. This translates into a permittee being allowed to exceed its pH limitations for a total of 7 hours and 26 minutes per month.^{*} In addition, no individual excursion^{*} from the pH limitation range may exceed 60 minutes in duration.

^{*} This is based on one percent of a 31-day month. See 47 Fed. Reg. 24536 (June 4, 1982).

^{*} "Excursion" is defined as an "unintentional and temporary" incident of noncompliance. 40 C.F.R. § 401.17(c). Intentional exceedances of the pH limitations, regardless of duration, remain subject to EPA enforcement action. 47 Fed. Reg. 24536.

Comment Number 3-E-19 (continued)

Docket Number LD12-00267

Commenter Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Miscellaneous Issues

Comment

EPA originally required 100 percent compliance with pH limitations under the NPDES program. In 1978, petitioners from a number of industries petitioned the Agency for relief from this requirement, and submitted extensive data supporting the request. In response to this petition, EPA conducted additional extensive studies of the control of pH in selected industrial categories. The cumulative data indicated that well-designed and well-operated plants using continuous pH monitoring will record excursions outside the prescribed pH limitation range approximately one percent of the time on a monthly basis. 47 Fed. Reg. 24535. No plant examined in the course of the Agency's review consistently achieved 100 percent compliance with the pH limitation on a monthly basis. *Id.* As EPA explained:

Adjustment of the standard to require compliance 99 percent of the time during continuous monitoring will establish a standard that well-operated and well-maintained plants can realistically achieve and will reserve the resources of both EPA and permittees for those instances when substantial pH control problems exist.

Id.

Consent Number 3 E-19 (continued)

Docket Number LD 12-00267

Commenter Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Miscellaneous Issues

Comment

The 60-minute limit on individual excursions serves to (1) promote immediate reaction to pH excursions; (2) facilitate enforcement against intentional excessive discharges; and (3) discourage the retention ("banking") of acidic or basic wastes which are discharged by the intermittent release of wastewater outside the permissible pH range for extended periods but controlled so that the total monthly excursion duration limitation is not violated. 47 Fed. Reg. 24535. The permitting authority may increase the individual excursion time limitation where a facility can demonstrate technological reasons which preclude it from limiting individual excursions to 60 minutes. 40 C.F.R. § 401.17(b); 47 Fed. Reg. 24536.

Consent Number 3-E-19 (continued)

Docket Number LD12-00267

Consentation Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Miscellaneous Issues

Comments

A compliance system similar to that applicable to NPDES dischargers is necessary under the land disposal restriction program. Without such a compliance scheme, even the most well-designed and well-operated facilities that continuously monitor pH will frequently be out of compliance with the BDAT. These temporary excursions are simply not relevant to the concerns served by the land disposal restrictions. Requiring facilities to meet the BDAT for corrosive wastes 100 percent of the time places a potential liability on facilities that is unwarranted by environmental concerns and which could potentially place an unnecessary load on EPA's enforcement resources. The adoption of a 99 percent compliance system such as that utilized in the NPDES program is a simple and effective means of avoiding these unnecessary burdens.¹¹

¹¹ Similarly, we believe that EPA should adopt regulations analogous to the upset and bypass provisions of the water regulations (40 C.F.R. §§ 122.41(m)(1)(i) and (m)(3)(i)) at least for facilities where the hazardous waste treatment or disposal facilities are part of the on-going operating facilities (e.g., an equalization basin that is part of the wastewater effluent system). Upsets and bypasses will occur in such facilities, due to the limitations of technology. To recognize this fact is simply to give recognition to what is achievable with the use of the "best demonstrated available technology," and as such, is clearly within EPA's authority. Indeed, we believe it would be beyond EPA's authority to fail to reflect the limitations of BDAT in the treatment standards.

COMMENT NUMBER: 3-E-19
DOCKET NUMBER: LD12-00267
COMMENTER: Allied Signal, Inc.
ISSUE: D002-Characteristic Ignitable Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

The Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for acidic and alkaline D002 wastes. Therefore, effluents will be required, as part of the land disposal restrictions, to be within a pH range of 2 to 12.5. Because of this wide range, EPA believes that any well-designed and well-operated facility will be capable of meeting the treatment standard 100 percent of the time. A list of applicable technologies that, when used alone or in combination, can achieve the standard, is included in 40 CFR 268 Appendix VI.

Comment Number 3E-20

Docket Number LD12-L0007.

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Miscellaneous Issues

Comment

5. EPA's Proposal Ignores the Organic and Inorganic Constituents in the Waste.

The Agency has neglected to consider the fact that acid and alkaline wastes that require neutralization often contain other organic and inorganic constituents. The sludges resulting from neutralization may be hazardous or may contain hazardous constituents in low concentrations. In the case of organic constituents, neutralization is often used to prepare the wastewater for steam/air stripping, biological treatment, or carbon adsorption, all of which will remove the organics. If a sludge is formed in the neutralization process, however, organic constituents that could have been destroyed by biodegradation or removed by stripping or adsorption will instead be transferred to the solid phase, where they will be either incinerated or land disposed. EPA's apparent preference for transferring organic constituents that are readily treatable in wastewater to a solid, where they will be disposed of without treatment or where they will require much more expensive treatment, such as incineration, is contrary to the intent of RCRA. Also, material recovery, as suggested by EPA, will be uneconomical for many precipitates resulting from wastewater neutralization. Contaminating constituents (metals and organics) would require pre-recovery treatment that is likely to be far more expensive than simply purchasing fresh precipitating agents.

Comment Number 3-E-20 (continued)

Docket Number LD12- L0007

Commenter CMA

Issue D002: Characteristic Corrosive Wastes

Subissue Miscellaneous Issues

Comment

The Agency has provided no rational technical or scientific bases for its proposed standards for acid and alkaline corrosive wastes (D002). The stated reasons are contrived and cannot be justified from either a technical or pollution prevention standpoint. EPA should set standards for alkaline and acid corrosive wastes at the current characteristic limits; this is the only environmentally and technically justifiable approach for the extremely diverse D002 wastes wastes.

- J. The Agency Has Proposed Recovery as a Method of Treatment for Acid and Alkaline Hazardous Wastes (D002). However, the Preamble Does Not Discuss Alkaline Waste Recovery. EPA Should Make It Clear in the Preamble That Recovery Is an Acceptable Treatment Method for Both Acid and Alkaline Wastes.

In section III.A.4.c.(2) (54 Fed. Reg. at 48,423), EPA discusses the recovery of acid wastes, but says virtually nothing about alkaline wastes. The proposed standards, however, are written to cover both types of corrosive wastes. CMA supports the designation of recovery as an acceptable BDAT treatment for both acid and alkaline wastes.

EPA should make certain in the final rule that it is clear that recovery can be applied, where appropriate, to acid and alkaline characteristic wastes.

COMMENT NUMBER: 3-E-20
DOCKET NUMBER: LD12-L0007
COMMENTS: CMA
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

The Agency agrees with the points made by this commenter. The Agency realizes that in many cases for D002 wastes that contain organics, neutralization is often a necessary pretreatment step for other treatment processes that remove or destroy the organics. If a sludge is formed during the neutralization process, organics may precipitate and be transferred to the solid phase where they will be either disposed of untreated or where they may require treatment by incineration. If however, those organic sludges exhibit a characteristic i.e., TC toxicity, then they must still be treated to the appropriate regulatory level.

The Agency is promulgating a treatment standard of "Deactivation to Remove the Characteristic of Corrosivity" for D002 acid and alkaline wastes. This standard will give the regulated community the flexibility needed to treat the wide diversity of D002 acid and alkaline wastes. A list of applicable technologies that when used alone or in combination can achieve this standard is included in 40 CFR 268 Appendix VI.

The Agency thanks the commenter for its support of recovery as a viable treatment option. Recovery is a BDAT option for both D002 acids and alkalines. Recovery options have been demonstrated for a variety of corrosive wastes. The Agency prefers recovery as a treatment standard, in that it results in no discharge of acidic or alkaline constituents into the environment and conserves resources. The legislative history of

COMMENT NUMBER: 3-E-20 (continued)
DOCKET NUMBER: LD12-L0007
COMMENTER: CMA
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

the land disposal restrictions also indicate that recovery is the preferred management alternative. The Agency lacks waste characterization data which indicates the wastes that are most amenable to recovery; therefore, the choice between treatment and recovery may be made by the generator or the centralized treatment operation, according to the applicability and performance of a given type of acid/base recovery system.

Comment Number 3-E-21

Docket Number LD12-L0023

Commenter Racon, Inc.

Issue D002: Characteristic Corrosive Wastes

Subissue Miscellaneous Issues

Comment

With regard to our specific circumstance - neutralization of byproduct HCl that is disposed by deepwell injection due to lack of market should be excluded. Determination of whether or not a stream requires neutralization should not rest only on a bill of sale. Byproduct HCl disposed by deepwell injection will have less potential risk than HCl used to acidify oil wells. The deepwell strata is certainly less probable for migration and the deepwells are definitely subject to greater regulations.

Deep well injection of both neutralized material and acidic material should not be included as part of these regulations, but considered individually during the UIC permitting process based upon the fluids appropriate for the receiving strata.

COMMENT NUMBER: 3-E-21
DOCKET NUMBER: LD12-L0023
COMMENTS: Racon, Inc.
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

Concerns seem to be alleviated by the final standard.

Comment Number

3-E-22

Docket Number

LD12-L0024..

Commenter

Dow Chemical

Issue: D002: Characteristic Corrosive Wastes

Subissue: Miscellaneous Issues

Comment

In our meeting yesterday about corrosivity LDR interest was expressed in receiving more information in three subjects.

1. Why doesn't Dow recover the HCl from the 280,000 gpd 6% HCl waste water stream from the Chlorinated Polyethylene (CPE) plant in Louisiana Division?

This waste water stream is generated at a very high temperature. If the acid were more concentrated in the plant, this stream would severely corrode the plant equipment. An external distillation column could be constructed of very corrosion resistant materials for a capital cost of about \$20 Million. This type of column could concentrate the acid to about 20% HCl. However, there is no market for the acid if it were concentrated.

2. The amount of NaOH and HCl seemed out of balance with the flowrate in the example using EC-1 in our waste water treatment plant.

This concern is accurate the flowrate is about 14,000,000 gpd not the 38,000 gpd discussed yesterday. I apparently made a mistake in generating the flowrate. The 77 Million pounds of NaOH and 71 Million pounds of HCl are accurate estimates of the base and acid the rule would require as proposed. Enclosed is a corrected copy of the document we gave you yesterday.

3. What concentration of contaminants would be appropriate as an upper limit for treatment in waste water treatment plants? This limit would appear in the definition of waste water.

We are still considering this concern. Ric Olson will provide a written response in the near future.

Comment Number 3-E-22 (continued)

Docket Number LD12-LD024.

Commenter Dow Chemical

Issue D002: Characteristic Corrosive Wastes

Subissue Miscellaneous Issues

Comment

Louisiana Division

Canal System (Once through cooling water and contact water)

180 -- 210 Billion GPY
500 -- 600 Million GPD
350 -- 410 Thousand GPM

Two plants currently co-neutralize their waste water streams.

CPE 280,000 gpd of a 6% HCl co-product.

Caustic 27,000 gpd of a 1-2% NaOH contact water.

(If the pH is above 11 the NaOH is recovered in the plant)

Our Solvents plant mixes the waste water streams from the plant in a mixing box. The stream impacted by these regulations is a 3% HCl stream which has a flowrate of 72,000 gpd.

Our EC-1 plant similarly mixes its waste water streams in a mixing box. This regulation would require the addition of 77 Million pounds of NaOH and 71 Million pounds of HCl per year to treat 14 Million gpd of waste water.

At Louisiana Division 13 plants are impacted by the corrosivity LDR. The rule would require the additional use of 163 Million pounds per year of HCl and 53 Million pounds per year of NaOH, forming an additional 335 Million pounds per year of NaCl.

	6-9pH
Capital	\$80 Million
Operating (year)	\$22 Million

Insoluble salt requirement would require the use of other ions. Silver is the best alternative for chloride. The additional salt would require 525 Million pounds of silver per year. At a cost of \$4 per troy ounce the silver would cost \$34 Billion per year.

COMMENT NUMBER: 3-E-22
DOCKET NUMBER: LD12-L0024
COMMENTER:
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

The commenter indicates that neutralization to a pH of 6-9 of his waste streams will be impractical, as is the insoluble salt requirement. The Agency has reconsidered the proposed rule and is no longer requiring neutralization to the 6-9 range, nor the generation of an insoluble salt.

A list of applicable technologies that when used alone or in combination can achieve the treatment standard is included in 40 CFR 268 Appendix VI.

Comment Number

3E-23

Docket Number

LD12-00267

Commenter

Allied Signal, Inc.

Issue

D002: Characteristic Corrosive Wastes

Subissue

Miscellaneous Issues

Comment

VIII. Deactivation is an Appropriate Treatment Standard for Those D001, D002, and D003 Wastes for Which It Has Been Proposed

EPA has proposed "deactivation as a method of treatment" for several subcategories of D001, D002, and D003 wastes. As we understand it, "deactivation" refers to any treatment that removes the characteristic. See 54 Fed. Reg. 48419. Examples of "deactivation" include open detonation, thermal destruction, specialized incineration, chemical oxidation, chemical reduction, and controlled reaction with water. *Id.* This list, however, is illustrative only because "the Agency believes that the actual method of "deactivation" chosen for each waste may be specific to that waste and may be best determined by the generator or the treater most knowledgeable as to the waste's unique hazards and handling requirements." *Id.*

~~Comment Number~~ 3-E-23 (continued)
~~Docket Number~~ LD12-00267
~~Comment~~ Allied Signal, Inc.
~~Issue~~ D002: Characteristic Corrosive Wastes
~~Subissue~~ Miscellaneous Issues
~~Comment~~

Allied completely agrees with EPA's premise. The wastes involved are dangerous wastes that present direct and immediate threats to the safety of the generator's employees. The generator must be given the flexibility to determine the best methods of handling and treating these wastes so as to minimize the dangers they pose to the employees. The requirement of "deactivation" will assure that these wastes are accorded genuine treatment that destroys the hazardous characteristic, while maintaining the generator's maximum flexibility to deal with the vagaries of the particular substance involved, in a way presenting the least danger to the generator's employees at the particular facility and treatment facility involved.*

* We believe that this proposed treatment method should be the equivalent of "no land disposal," but that, in light of other aspects of the preamble, it is not. The concerns of some commenters to previous land disposal restriction rules over the effect of a "no land disposal" treatment standard, *id.*, should not be relevant to characteristic wastes, because once the characteristic waste loses its characteristic it ceases to be a hazardous waste. However, in light of the legally erroneous interpretation of Section 3004(m) announced in the preamble, such that a characteristic waste "destined" for land disposal would become subject to the treatment standard at the point of generation and would remain subject to the treatment standard even after ceasing to be a hazardous waste, a "no land disposal" treatment standard would be a totally inappropriate standard. It would preclude any land disposal of the harmless residue of any of the various deactivation methods that might be applicable to the particular waste.

...
Consent Number 3-E-23 (continued)

Docket Number LD12-00267

Consentee Allied Signal, Inc.

Issue D002: Characteristic Corrosive Wastes

Subject Miscellaneous Issues

Comments

The option of specifying one technology, such as open detonation, for all of these wastes would be a serious mistake. It would impose a serious burden on EPA through the variance procedure, and, more important, it would create substantial regulatory uncertainty until EPA could deal with the variances. Further, this regulatory uncertainty could lead some generators to attempt to utilize the specified technology, even if inappropriate, with potentially very serious consequences to safety. Generators should not be confronted with a choice between compliance with EPA's regulations, on the one hand, and the safety of their employees, on the other.

For example, if the treatment standards required open detonation for "other reactive" wastes, then Allied would be forced to choose between complying with this treatment method for its chlorosilane wastes generated at its Delaware Valley Works, or continuing its much safer existing practice of sending these wastes to an incinerator in specially packaged one-gallon glass containers. The availability of a treatability variance to resolve issues like this is inadequate for two reasons: First, EPA is unlikely to be able to review and act on all such variance requests by the May 8, 1990 effective date of the treatment standard, and, therefore, for some uncertain period of time, Allied would be confronted with this unfair choice between complying with regulatory requirements, on the one hand, and taking those actions most protective of the safety of its employees. Second, some companies other than Allied could well decide that the costs and burdens of seeking such a variance are not worth the effort, even if it means that the safety of their employees would be adversely affected. This would be an intolerable situation, but entirely predictable. EPA must not create disincentives for companies to protect their employees.

COMMENT NUMBER: 3-E-23
DOCKET NUMBER: LD12-L0267
COMMENTER: Allied Signal, Inc.
ISSUE: D002 - Characteristic Corrosive Wastes
SUBISSUE: Miscellaneous Issues
RESPONSE:

The Agency appreciates the commenter's support concerning the "deactivation" standards. EPA agrees with the commenter that specifying technologies would create a serious burden on EPA through the variance procedure and may cause some generators to utilize an inappropriate technology for their waste to avoid the variance procedure. Consequently, EPA has promulgated "Deactivation to Remove the Characteristic" for most characteristic waste subcategories. A list of recommended deactivation technologies that can achieve the standard is located in 40 CFR Section 268 Appendix VI.